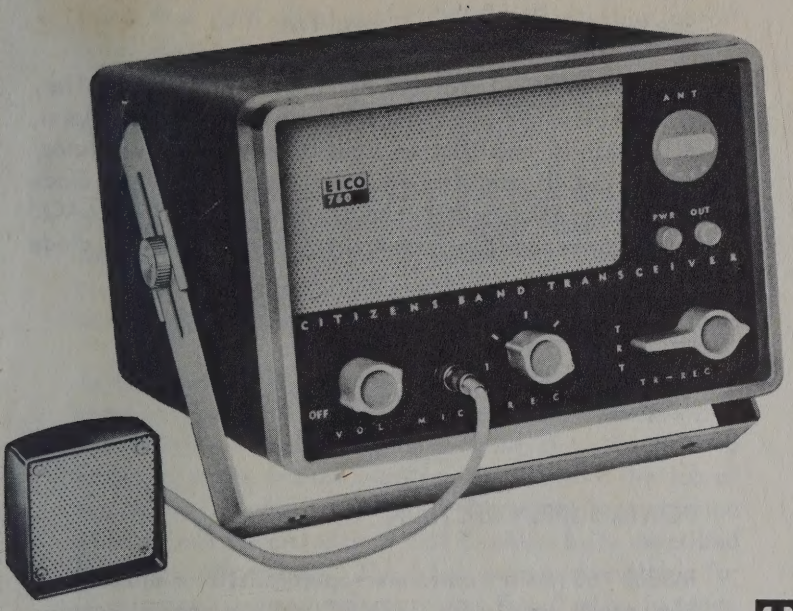

Model 760

CITIZENS BAND TRANSCEIVER

general description

GENERAL

The EICO Model 760 is a thoroughly useful and reliable Citizens Band (CB) transceiver for use as a base station where a 117VAC line is available for its operation. It consists of a 5 watt crystal-controlled transmitter and a sensitive, selective superheterodyne receiver with RF stage and noise limiter. The unit includes a built-in speaker and a detachable ceramic microphone.

The transmitter circuit, in the kit model as well as the factory-wired, is supplied with pre-set and sealed crystal oscillator circuit elements that will produce on-frequency operation with any channel EICO crystal. In addition to the fact that the oscillator circuit is broadly tuned, this facility hinges on the fact that each and every EICO crystal is ground to oscillate at its specific frequency with exactly the reactance across its terminals that is presented by each and every pre-set crystal oscillator circuit in every unit. Using only EICO crystals, it is possible, by simply changing crystals, to shift from any transmission channel to any other without adjustments to maintain on-frequency operation. Furthermore, a metering jack is provided to permit measurement of the plate current in the final RF stage of the transmitter. Using any good milliameter (or volt-ohm-milliameter) and a PL-55 phone plug as an adaptor, it is thereby possible to make certain adjustment of the RF input power to the 5-watt maximum set by FCC regulation.

A variable "pi" network permits matching to most popular types of antennas. A dummy load is provided also for off-the-air transmitter tuning (permitting practice adjustments without radiating energy prior to adjustment to a real antenna). Directly-attached base-loaded portable whip and mast-mounted ground plane (roof) antennas are available as accessories.

The identical transceiver is available in other models with dual power supplies permitting either mobile use (battery operation) or base station use (117VAC line operation). The Model 761 is designed for 117VAC or 6V battery operation, and the Model 762 for 117VAC or 12V battery operation.

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specifications

TRANSMITTER SECTION

Power Input: 5 watts to plate of final RF amplifier (FCC maximum).

Transmitter Frequency Range: 26.965 — 27.255mc

Transmitter Frequency Control**: 3rd overtone type quartz crystal operating within 0.005% of marked channel frequency between -32°F and 140°F. May be operated on any one of 23 available channels. Only EICO or EICO-approved crystals may be used or violation of FCC regulations may occur due to off-frequency operation. (Eico crystals provide specific capacity allowed for in tuned circuits of the transceiver).

**Crystal oscillator circuit elements factory pre-set and sealed — will operate properly with any of the 23 Class D channel 3rd overtone crystals.

Modulation: AM plate modulation automatically limited to less than 100% (FCC requirements).

Output Impedance: Variable "pi" network permits adjustment to most popular antenna types.

Antenna Connectors: One on rear apron for connection of separate antenna of any type; facilities for either top mounting or panel mounting of directly attached base-loaded portable whip antenna.

Accessory Antennas Available: Base-loaded portable whip, rear bumper mounting antenna, ground plane (roof) antenna.

Dummy Antenna Load: Supplied for off-the-air tuning of the transmitter.

Indicators on Panel: Pilot light, transmit indicator light.

Microphone: Ceramic element, plastic case, with cord and connect.

RECEIVER SECTION

Receiver Type: Superheterodyne with RF stage and built-in noise limiter.

Tuning Range: 26.965 - 27.255mc

Sensitivity: 1 microvolt for 10db signal-to-noise ratio.

Audio Output: 1 watt; 2 watts with tolerable distortion.

Speaker: Built-in 3" x 5" oval PM

Tube Complement (Total of 7): 12BY7 final RF amplifier, 6BA6 receiver RF amplifier, 6U8A mixer — local oscillator, 6U8A 1st IF amplifier — transmitter crystal oscillator, 6U8A 2nd IF amplifier — audio amplifier, 6FM8 diode detector — noise limiter — microphone preamplifier, 6AQ5 audio power amplifier; power supply employs silicon diode rectifiers.

Size (Less Antenna) HWD: 6" x 8 1/2" x 9"

Shipping Weight (All Models): 12 lbs.

POWER SUPPLY SECTION

Model 760 has a transformer-operated silicon diode doubler power supply for 117VAC, 60 cps operation only.

ORIGINAL EQUIPMENT

CB Transceiver as described, microphone with cord and connector, CB crystal. Antenna is not supplied as part of original equipment.

ACCESSORIES

a) Additional Crystals: Available frequencies on request.

b) Model AT-1 Base-Loaded Portable Whip Antenna: Can be directly attached to either top or panel of transceiver unit. Vinyl covered loading coil wound into rod reduces length to 40". Complete with PL-259 connector fitting top or panel connector on transceiver unit. Weight 1 lb., 4 oz.

c) Model AT-3 Ground Plane Antenna: A roof-type non-directional antenna fitting 1" IPS pipe. Vertical radiator and four 2-piece radials are solid aluminum, all removable from the cadmium plated steel mounting bracket. "U" bolt hardware furnished. Base accepts PL-259 connector. Supplied with 50' of RG-58/U having PL-259 connector at one end and auto-radio lead in connector on other end. Weight 3 1/2 lbs.

installation

POWER CONNECTIONS

Insert line cord plug into 117VAC, 60 cps line outlet only. Use a 1 ampere fuse.

ANTENNA CHOICE & INSTALLATION

The Model 760 conforms to the FCC regulation for Class D transmitters which limits final-stage input power to 5 watts. With this amount of power, the communication range will vary greatly with terrain, interference, as well as antenna type, height, and loading.

As the Model 760 is a base station unit, only two of the antenna types offered by EICO need be considered: first, the AT-1 base-loaded whip antenna which can be directly attached to the transceiver through a hole at the top of the cabinet, and second, the AT-3 ground plane antenna which is mast-mounted on a roof (both are fully described in the specifications). The AT-1 antenna is suitable for short range communications, about 2 to 3 miles in urban areas (and greater in open, flat terrain) assuming installation in buildings not shielded by metal. The AT-3 antenna provides the greatest possible omni-directional coverage and must be used for reliable communication over 3 miles in urban areas or whenever the building is shielded by metal; a range up to 7 or 8 miles is possible, although not assured, in urban areas and greater in open, flat terrain. The AT-3 antenna should be mounted as high as possible within the legal limit established by the FCC (no higher than 20 ft. above the structure on which the antenna is mounted).

With the ground-plane antenna, it is preferable to avoid a lead length longer than the 50 ft. supplied. It is possible, however, to use a line length up to 100 ft. if it is done in order to achieve a superior antenna location. On the other hand, if the 50 ft. line supplied is too long, it is not necessary to cut it to length. Simply coil up the excess length and place it somewhere out of the way. If you do cut the line, be sure the connector on the transceiver end is properly attached to the cut end of the line.

It is essential for good antenna performance to connect the transceiver to a good earth ground. The earth ground wire can be attached under the wing nut on the rear chassis apron.

operating instructions

OPERATING INFORMATION

To receive, set the TRANSMIT-RECEIVE switch to RECEIVE, turn the VOLUME/OFF control clockwise to a point that will give a comfortable listening level, and adjust the RECEIVER tuning control to the transmitting station channel.

To transmit, set the TRANSMIT-RECEIVER switch to either the upper TRANSMIT position or hold down at the lower spring-return TRANSMIT position, and speak directly into the microphone in a normal tone of voice with the microphone 4" to 8" away. "Shouting" will not help as it only results in distortion and loss of intelligibility.

Note that you cannot transmit and receive simultaneously. This means, that while you are transmitting you cannot hear any comments or interruptions from the station you are talking to. Likewise, while you are receiving, the transmitting station cannot hear any comments or interruptions made by you. For this reason, it is better not to ask a long series of questions during one transmission, but to ask only one or two questions at a time, allowing these few questions to be answered before asking new ones in the following transmission. Jotting down information on a pad is helpful in this type of communication.

Station call letters must be stated at the beginning and end of every series of transmissions, but need not be repeated in between so long as the series of transmissions is under 10 minutes total duration. For longer communications, station call letters must be repeated every 10 minutes. To avoid confusion, always state at the beginning of each transmission the number of the unit in the system that is transmitting and the one being addressed, such as "Unit 1 to Unit 2". In order to avoid incomplete transmission, also indicate clearly that your transmission is over by such phrases as "go ahead" or "come in please". At the end of the series of transmissions, indicate it clearly by such a phrase as "Unit 1 signing off and clear with Unit 2".

OPERATING NOTES

a) Form 505, permitting application for a station license from the FCC, has been supplied with the unit. No examination is required. It is a violation of FCC regulations (Part 19) governing Citizens Band (Class D) radio service to operate a transmitter prior to receipt of a license and a call sign.

   The certification at the bottom of Form 505 contains a statement that the applicant has a current copy of Part 19 of the Federal Communication Commission's Rules governing the Citizens Radio Service. Part 19 is now included in Volume VI of the Commission's

Rules which is available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

If you do not actually have a copy of Part 19, you may still file your application if you state under "Remarks" that you have ordered a copy of Volume VI from the Government Printing Office. You should also strike out that part of the Certification which deals with possession of a current copy of Part 19.

An Order Form for Volume VI is supplied along with Form 505. Send the filled out order form for Volume VI to the Government Printing Office, not the Commission.

b) It is possible for a station on the same channel as you to interfere if that station can reach the station you are contacting with roughly equivalent or greater signal strength. It is evident that this situation resembles the telephone "party line". The only feasible as well as courteous way of dealing with this situation is to wait until the interfering station is through before using the channel. If the situation is chronic and prevents satisfactory use of the system, it may be remedied by installing a crystal for a channel on which there is no regular interference.

c) If there are only two stations in a system, each may transmit on a different channel from the other without difficulty. If there are three or more stations in a system, it is only practical for all stations to transmit on the same channel.

d) A properly operating transceiver will not interfere with AM broadcasts, but a slight amount of interference to weak FM signals at the high frequency end of the FM band or to weak television signals on channels 2 and 5 may occur if the transceiver transmitting antenna is located close by to the FM/TV receiver antenna. Moving the antennas further away from each other will usually eliminate any interference.

e) The RECEIVER tuning dial is calibrated in channel numbers, 1 to 23. A table of channel numbers vs. frequencies is given below. Please note that the calibration of the RECEIVER tuning dial is only approximate and is provided for reference purposes only. When tuning in a particular channel, do not expect to find it right where the channel number appears on the dial. Rock the tuning knob around the particular channel number on the dial until you tune in the desired station.

f) If you are interested in obtaining more information on the legal and technical aspects of operating a Class D Citizens Band station, you are referred to an excellent book titled "Class D Citizens Radio" by Leo G. Sands (Ziff-Davis publisher).

Channel No.	Frequency (MC)	Channel No.	Frequency (MC)
1	26.965	13	27.115
2	26.975	14	27.125
3	26.985	15	27.135
4	27.005	16	27.155
5	27.015	17	27.165
6	27.025	18	27.175
7	27.035	19	27.185
8	27.055	20	27.205
9	27.065	21	27.215
10	27.075	22	27.225
11	27.085	23	27.255
12	27.105		

circuit description

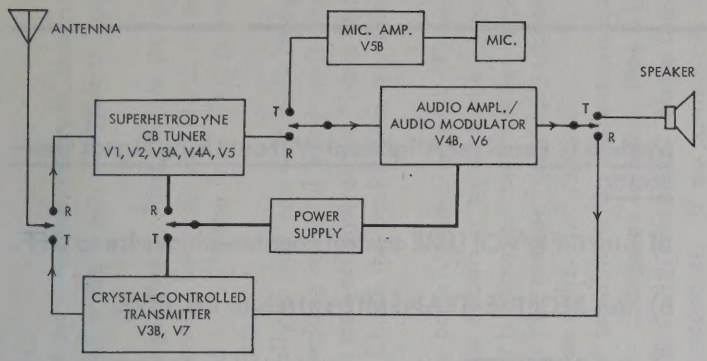
The transceiver consists of four circuitry blocks as follows:

a) Superheterodyne CB tuner including RF amplifier V1, mixer V2, two I.F. amplifiers V3A and V4A, detector and noise limiter V5A.

b) Audio amplifier-modulator. As receiver audio amplifier, it consists of audio voltage amplifier V4B, audio power amplifier stage V6, combination modulation and output transformer T1, and speaker SP1. As transmitter modulator, microphone amplifier V5B is added to the above mentioned stages and speaker SP1 is disconnected from T1; instead, a special winding of T1 feeds modulating energy to the final RF amplifier V7.

c) Crystal-controlled transmitter including crystal oscillator stage V3B, and final RF amplifier V7.

To summarize, the superheterodyne CB tuner and the crystal-controlled transmitter are each independent circuitry blocks. The audio amplifier-modulator and the power supply blocks are connected to the superheterodyne CB tuner block at the RECEIVE position of the TRANSMIT-RECEIVE switch S1 to form a CB receiver, and to the crystal-controlled RF amplifier at either TRANSMIT position to form a CB transmitter. The audio amplifier-modulator is always energized by the power supply, but the crystal controlled RF amplifier is energized only at the TRANSMIT positions and the superheterodyne CB tuner only at the RECEIVE position. The speaker is connected only at the RECEIVE position. The antenna is connected to the input of the CB tuner at the RECEIVE position and to the output of the CB transmitter at the TRANSMIT positions. In the block diagram given here, the switching shown is a simplified version of that accomplished by switch S1.



DETAILS OF EACH BLOCK

a) Superheterodyne CB Receiver: From the antenna the incoming signal is fed to RF transformer L3 where it is stepped up and fed to the control grid of the RF amplifier V1. The amplified signal is developed across the plate tank L4 and C12 from where it is fed to the control grid of the mixer section (pentode) of V2 via coupling capacitor C15. RF transformer L3 and the plate tank L4 and C12 are tuned broadly to cover the entire CB frequency range. The triode section of V2 is the local oscillator employing a tank circuit comprised of L5, C22, C23, and variable capacitor C21 which is the RECEIVER tuning control. The frequency range of the local oscillator is 25.215 — 25.505mc, exactly the 1750kc intermediate frequency below the CB frequency range of 26.965 — 27.255mc. The local oscillator tuning range is set by adjusting L5 with C21 fully closed to generate the lowest required frequency of 25.215mc (method given in detail in the tuning procedure). The local oscillator frequency is fed to the grid of the mixer section (pentode) of V2 via capacitor C17, which injects enough signal for proper mixing, and in the output of the mixer both the sum and the difference frequencies of the local oscillator and the RF input frequencies are obtained. Only the difference frequency is in the region of the 1750kc intermediate frequency which the succeeding IF amplifiers stages are tuned to pass and amplify. As C21 is opened by turning the RECEIVER tuning control, each of the CB channels 1750kc above the local oscillator frequency is "tuned in" in turn. Any CB RF signal from 26.965 to 27.255mc thus "tuned in" is now converted to a 1750kc signal which is greatly amplified with a high degree of selectivity by the IF stages V3A and V4A. There are three tuned IF transformers T2, T3, and T4: T2 couples the mixer to the 1st IF stage, T3 couples the 1st IF stage to the 2nd IF stage, and T4 couples the 2nd IF stage to the detector. The detector is a series diode type, the diode being the section terminating in pins 1 and 6 of the pair denoted V5A. The second diode of the pair, terminating in pins 2 and 3, is used as a series noise limiter. The detected audio signal is taken off volume control R25 and fed to the input of the audio amplifier section V4B and V6 when switch S1 is set at RECEIVE.

b) Audio Amplifier-Modulator: V4B and V6 constitute a conventional triode audio voltage amplifier driving a beam power pentode output stage. When switch S1 is set at RECEIVE, the detected audio taken off volume control R25 is fed to the control grid of V4B and the combination modulation and output transformer T1 couples the V6 output stage to speaker SP1. When switch S1 is set at either TRANSMIT position, the output of microphone amplifier V5B is fed to the control grid of V4B. In the V5B stage, L7, C36, and C37 constitute an RF suppression filter. Also, the secondary winding of T1 is opened (thus disconnecting the speaker) and the tapped primary winding of T1 behaves as an autotransformer for modulation purposes, feeding the audio output from the primary tap to the screen of the final RF amplifier V7.

c) Crystal-controlled Transmitter: Constituted of a crystal oscillator stage V3B driving a final RF amplifier V7 which is plate modulated by the audio modulator described above. The crystal is in the grid circuit of V3B, and tunable inductor L6 with its parallel stray capacity constitutes a tuned plate load. L6 is adjusted to resonate with its stray capacity at the center of the CB frequency range to constitute an optimum load for third harmonic operation at all CB crystal frequencies. Capacitors C44 and C46 comprise a voltage divider from which is derived positive feedback to the grid of V3B for the purpose of increasing the drive to the amount required. Capacitor C45 adds to the shunt capacity across the crystal to provide, together with stray capacity, the proper capacitive load for the crystal (approximately 20mmf). The output of the crystal oscillator is fed through capacitor C1 to the control grid of final RF amplifier V7. The plate tank circuit of final RF amplifier V7 is composed of inductor L2 and two adjustable trimmer capacitors C6 and C7 connected as a "pi" network for accepting antenna loads with different characteristics. C6 is used to adjust the tank circuit to resonance at the transmitted frequency, as evidenced by minimum V7 cathode current, and C7 is used to adjust for maximum power transfer to the antenna allowed by FCC regulation with any antenna connected, indicated by a V7 cathode current of 27-28ma maximum. These two adjustments interact and a detailed procedure is given in the alignment instructions. TRANSMIT indicator lamp I1 is operated by RF power at the plate of the final RF amplifier V7 and will flicker in response to the speech modulation.

d) Power Supply: Includes the following: power transformer T5; silicon diode voltage doubler circuit consisting of CR1, CR2, and the two sections of C52 designated by square and triangle; B+ filter circuit consisting of R37 and the section of C52 designated by a half-round. Provides a filtered DC voltage of 250V ±10%. The same power supply is used for both transmitting and receiving. ON indicator lamp I2 indicates the application of power. The circuit blocks energized in each mode is evident from the block diagram.

GENERAL

Your transceiver should require little service except for normal tube replacement. No substitution for tube types used in this tuner is permissible. Transceivers built from the kit form must have a "touch-up" alignment of the receiver section by one of the procedures given; the transmitter section is pre-set and sealed at the factory with the crystal supplied. All transceivers, kit or factory-wired, must have their power output adjusted with the particular antenna used connected according to the procedures given.

RECEIVER SECTION ALIGNMENT

Two methods will be given, one not requiring the use of a signal generator and the other making use of a signal generator. Both methods, however, require the use of a VOM having a sensitivity of 2000Ω/V or higher (EICO 555, 565) or a VTVM (EICO 232, 221). Note, however, that all coils and IF transformers supplied in your kit are pre-adjusted to a degree of accuracy that will necessitate only a "touch-up" adjustment in order to obtain perfect alignment. Usually less, but no more than a half-turn of the adjustment screw will be required on any coil or IF transformers. In any event, do not attempt alignment before there is enough evidence that the receiver section is in proper working order as determined by the following procedures:

a) Turn VOLUME control completely clockwise.

b) See that all tube filaments are lit.

c) With the TRANSMIT-RECEIVE switch set at the RECEIVE position, touching of a screwdriver held by the blade to the center post of either antenna connection jack should result in a "click" heard from the speaker.

d) Check voltage on all tube socket pins against the voltage Chart.

If your unit does not check out properly in these tests, it is not only useless to attempt alignment, but, more likely than not, you will mess up the pre-adjustments on the coils and IF transformers, and make it more difficult to align the receiver after you get it in proper working order. Instead, consult the trouble shooting procedures, read the circuit description, and study the schematic diagram to help discover and remedy the trouble. It may be necessary to go over the wiring step by step in order to discover a wiring error. If possible, do this with a friend, since we are sometimes blind to our own mistakes. If your unit does pass these tests, proceed to one of the receiver alignment methods below. Note that the receiver section alignment necessitates removal of the cabinet. It is easiest to perform the alignment with the transceiver lying on its left side. No antenna is connected.

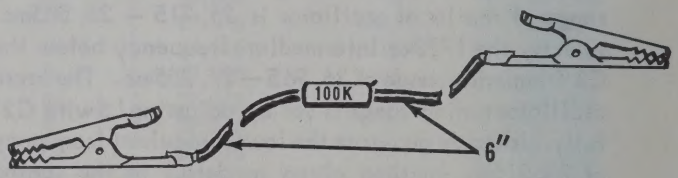
Method 1: Receiver Alignment Without Using Signal Generator:

a) Turn OFF/VOLUME control counter-clockwise to OFF.

b) Set RECEIVE-TRANSMIT switch to RECEIVE.

c) Set RECEIVER tuning control at the same channel on the dial as the transmitter crystal you are using. For example, if you are supplied with a channel 10 crystal (27.075mc), set the RECEIVER tuning knob at 10 on the dial.

d) The signal used for alignment is obtained from the transmitter section, which is normally de-energized at the RECEIVE position of the RECEIVE-TRANSMIT switch. In this method, we energize the crystal oscillator stage only by "defeating" the disconnection of this stage from the B+ supply with an apparatus consisting of two alligator clips, two 6" lengths of hook-up wire, and a 100KΩ, 1/2 watt resistor. A 6" length of hook-up wire is connected and soldered to each pigtail lead of the 100KΩ resistor, and an alligator clip is connected and soldered to both free ends of the 6" wires as shown below.



Connect one alligator clip of this apparatus to the terminal of the three-section electrolytic capacitor C52 designated by a triangle ( ) mark (T5 red lead) connects to this point). Connect the other alligator clip to the terminal of R36 (22KΩ) going to switch contact S1-2A. In this way, the crystal oscillator V3B is energized with a poorly filtered B+ voltage and the oscillator energy will be radiated around the chassis with a 120 cycle modulation which can be detected and measured to indicate the sharpness of alignment of the receiver circuits.

e) Rotate OFF/VOLUME control clockwise from OFF position to turn the transceiver on, and allow ten minutes warm-up to achieve stable operation.

f) Alignment of Local Oscillator: Adjust the VOLUME control to a point where the 120 cycle hum is heard clearly. Now use a tuning wand or insulated screwdriver to turn the adjustment screw on L5 left or right slightly until a point is reached where the strength of the audible hum out of the speaker is at a maximum. This completes the adjustment of the local oscillator. Turn the volume control to OFF. Do not remove the apparatus connected earlier.

GENERAL INSTRUCTIONS

The EICO kit you are about to assemble and wire has been designed to meet the highest standards of performance. It is a high quality instrument, to be constructed from the finest components available anywhere.

The following Construction Manual has been written to carefully guide you through the construction of your kit. If you follow all the instructions implicitly and work carefully without haste, you will be rewarded with many years of fine performance from this instrument and a personal inner satisfaction from a job well done.

Your Construction Book: Beginning with the number on this page, and throughout the rest of your Construction Manual, the page numbers are followed by a "C" (1C, 2C, etc.). The Instruction Manual, detailing the installation, operation and maintenance of your instrument, are identified by numerals only, without any letters following these numerals.

Observe that the Instruction Manual section precedes this page and follows the last page of your Construction Book section. After you are certain that you have successfully completed the wiring of your kit, you no longer need the Construction Book. You may remove these centrally located Construction pages, leaving the Instruction section intact for future reference. Keep the Instruction Manual for information as to the installation and operation, as well as for any maintenance that may be necessary in the future, on your amplifier.

Choosing a Workbench and Tools: To avoid the accidental loss or misplacement of components, choose a convenient workbench before unpacking your new kit. You will find it most advantageous to choose a corner on a table that will not be used for any other purpose until you have completed the construction of your kit. Proper precautions should be observed to prevent damage to any table top from a soldering iron or any heavy tools.

When you check the component parts against the Parts List later on, it will be convenient to separate the various pieces into types of components and hardware sizes. It will be convenient to keep these sorted pieces separated in the compartments of specially made trays. Small cartons, egg trays or a refrigerator ice tray with dividers serve equally well.

Several basic tools are required to constructing this kit. They are:

1. Screwdriver - 3/16" to 1/4" blade
2. Gas Pliers
3. Longnose Pliers - 5" or 6"
4. Screwdriver - 1/8" blade
5. Diagonal wire cutters
6. Soldering iron (100 watts), solder gun or pencil iron (35 watts).
7. High quality rosin core radio solder. DO NOT use Acid Core solder or paste fluxes under any circumstances.

The following tools are useful, but are not absolutely necessary to construct this kit: 1) Socket wrench set, 2) Open end wrench set, 3) Wire stripper

Unpacking the kit: This procedure serves two purposes. First, it lets you get acquainted with the various types of components. Second, you check to ascertain if you received all the parts required to build the kit. This is your opportunity to have any packing errors corrected.

When unpacking, handle all parts carefully so that you will not damage any fragile components. Do not throw any packing material away until after having checked all components. Check each part off against the "Parts List" which you will find in your Instruction Book. Check the packing for any small parts.

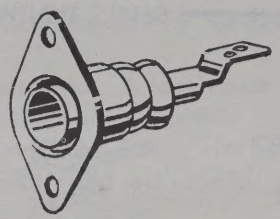
A number of components appearing on the parts list have asterisk (*) next to them. These parts are either prewired to the chassis or taped to the bottom of the chassis and do not require checking. It is important that the two tubes and the crystal taped to the bottom of the chassis be removed and kept separate from all other components since they have been calibrated specially.

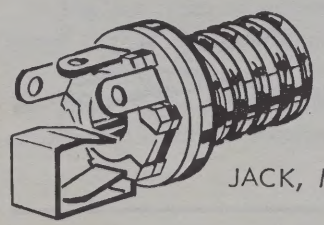
From time to time, due to modernization or possible error, corrections may be necessary to your Parts List. If there are any changes to be made, they will be listed on the loose "addenda sheets" included with this book. Make these corrections, if any, before checking your components. If no corrections to your Parts List are noted on the addenda sheets, or there are no addenda sheets, assume your Parts List is correct, and commence to check all components against this list.

To enable rapid identification of electronic parts, each part has been assigned one or two letters of the alphabet called a reference designation. These reference designations are nothing more than an initial letter or two representing the name of the part. For example, a vacuum tube has been assigned the reference designation letter V, and a transformer the letter T. Thus, if you have seven vacuum tubes and three transformers in your kit, these parts would be identified by the designation V1 through V7 and T1 through T3, respectively.

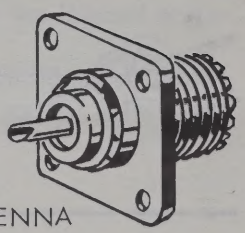
The reference designation assigned to receptacles (often referred to as jacks) is the letter J. The different types of jacks and plugs used in this kit are so lettered and illustrated in the construction steps.

JACK, ANTENNA





JACK, METER



RECEPTACLE, ANTENNA

Capacitors have symbol numbers starting with a C.

Some capacitors, such as electrolytics, are marked with a + and a -. These are the only capacitors that must be mounted in a specific direction. Follow the direction for mounting described in the appropriate steps below. When no direction is mentioned, mount the capacitor either way. Some molded or paper capacitors have a black line near one end. Although these can be mounted without any concern for direction, it is preferable that you follow the direction for the black line shown on the drawing. If there is no black line on the drawing or on the capacitor, just mount the capacitor in either direction.

Ceramic capacitor tolerance may be noted by a letter rather than a number. A "K" indicates 10%. An "M" indicates 20% and a "P" indicates a GMV.

Ceramic capacitors have specific temperature characteristics — percent and degree of variation of capacity with temperature. These variations are indicated by means of a code number stamped on most capacitors. For example 12 N-750 is stamped on a 12mmf capacitor having an N-750 temperature characteristic. The actual meaning of the N-750, or any other characteristic, is important to the engineer. When building the kit, be sure to use the characteristic specified by the engineer, if it is indicated in the construction steps. If no value is indicated in the construction book, use any of the ceramic capacitors of proper value supplied with the kit.

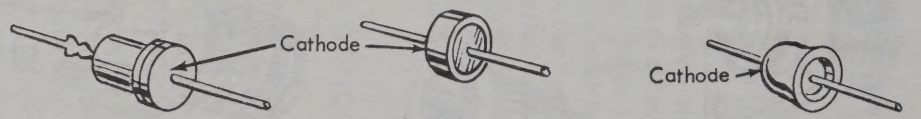
Resistors are denoted by the symbol letter R.

Some resistors have their resistance value stamped on the surface of the resistor body. However, other fixed resistors are coded with color marking which indicate their value. The actual color code of these resistors is noted in the parts list. In some instances, even when the color code is noted, in the book, the actual resistor value may be stamped on the body, rather than the color code.

The tolerance of a resistor is the amount the resistance value can vary around its marked value. Thus, if a 1K (1000Ω) resistor has ±10% tolerance, its actual value can be between 900 ohms and 1.1K ohms. If the same resistor has a ±5% tolerance, its actual value can be between 950 ohms and 1.05K ohms. The fourth color band from the end of the resistor, indicates the tolerance. The gold band indicates a 5% tolerance, the silver band a 10% tolerance and the absence of a band a 20% tolerance. This tolerance value is always stated or given as part of the color code when the resistor is listed. If the resistor is marked with a number rather than a color code, the tolerance, is stamped on the body. In your kit, 5% resistors may be substituted for 10% and 10% resistors substituted for 20%. However, be certain that you do not use a 10% resistor when a 5% resistor is required or a 20% resistor when a 10% or 5% resistor is specified.

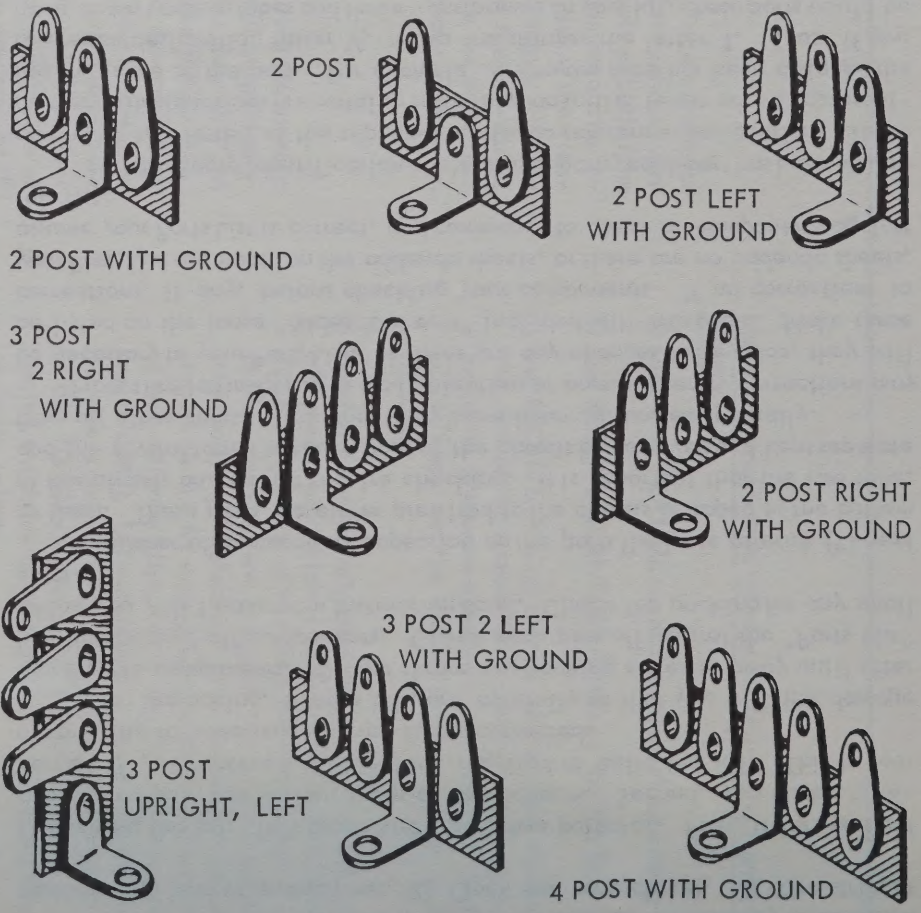
Silicon rectifiers are efficient diodes replacing rectifier tubes. One end is the cathode (+). On the second end is the anode (-). The various possible shapes of rectifiers used are illustrated. The cathode and anode ends are designated in the drawing.

SILICON RECTIFIERS



TERMINAL STRIPS

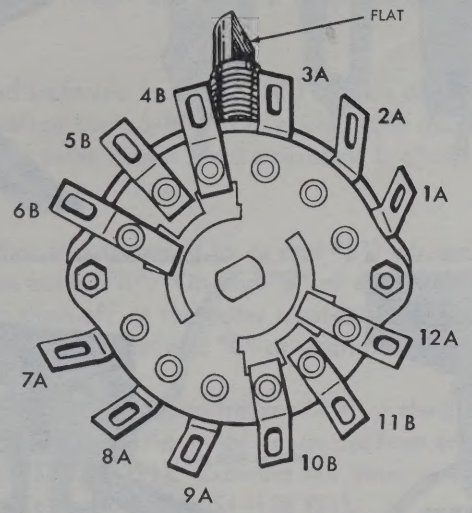
The various types of terminal strips are assigned the designation letters TB. The types used in this kit are illustrated and denoted in this figure.


2 POST WITH GROUND
2 POST
2 POST LEFT WITH GROUND
3 POST 2 RIGHT WITH GROUND
2 POST RIGHT WITH GROUND
3 POST UPRIGHT, LEFT
3 POST 2 LEFT WITH GROUND
4 POST WITH GROUND

Switches are designated by the letter S. S1 refers to the switch assigned number 1, S2 refers to the switch assigned number 2. Switches may take several forms. In the 760, the rotary switch is assigned the designation S1.

The various lugs on this switch are identified as follows. See Figure for a drawing of this switch.

TRANSMIT/RECEIVE SWITCH S1



Switch shown in middle position

Turn the switch to its center position described in the wiring instructions for the switch. The exact position of the lugs referred to are determined by looking at the switch from the view shown in the figure. Each side of the wafer has been assigned a letter. Each lug has been assigned a number. The lug is referred to by the wafer number and lug designation. Thus, lug S1-2A refers to selector switch S1, the "A" side of the wafer (side facing the front apron) and 2 refers to the lug on this particular side of the wafer.

Hardware is a general term for mechanical parts used in the assembly of EICO kits. Such items are usually screws, nuts and washers. Machine screws are sized in accordance with the diameters of the threaded portion (#4, #6, #8, #10) with the smaller number denoting the smaller diameter. The second number indicates the number of threads to an inch. Thus, a #6-32 screw has a #6 diameter with 32 threads per inch. The final number indicates the length of the threaded portion. A #6-32 x 3/8 has a 3/8" long threaded portion. The diameters are shown in the figure.

HARDWARE ITEMS

#4-40 x 3/8 Machine Screw

#4 Lockwasher

#4 Ground Lug

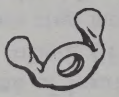
#4 Hex Nut

#10-32 x 1/2

#10 Flat Washer

#10 Lock Washer

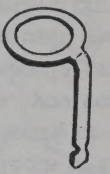
#10 Hex Nut


#10 Wing Nut

#6-32 x 1/8 Set Screw

3/8 Flat Washer

3/8 Lock Washer


3/8 Ground Lug

3/8 Hex Nut

3/8 Rubber Grommet

ACTUAL DIAMETERS

NO. 4 NO. 6 NO. 10

Washers and nuts are sized in accordance with the diameter of the screws they are used with.

Various types of washers are supplied. A lockwasher has internal or external teeth. A flat washer is made out of thin metal.

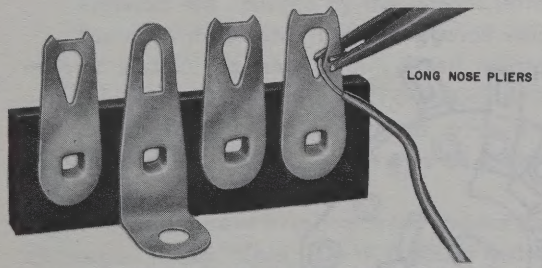
Grommets are rubber devices used for insulating wire from the metal chassis.

Most of the other component parts used with the kit are self evident and require little further explanation or description.

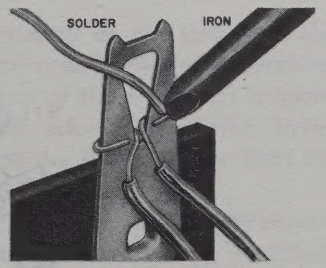
Soldering Techniques: To get a good, clean connection, use the soldering techniques described below. USE THE BEST GRADE OF ROSIN CORE RADIO SOLDER ONLY. UNDER NO CIRCUMSTANCES SHOULD ACID CORE SOLDER OR FLUX BE USED. The use of acid core solder or paste fluxes can cause serious corrosion and will void all the repair and service guarantees.

The soldering and wiring techniques described below should be practiced several times by the novice before he attempts to wire or solder components in the actual kit. Practice several connections with a spare piece of wire and a socket or terminal strip you can purchase at your local jobber.

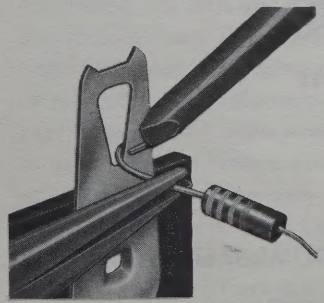
First make a good mechanical connection. Remove 1/4" of insulation from the end of the wire. Feed the wire through the solder lug opening so that the wire insulation just touches the lug. With the long-nose pliers, bend the wire lead around the lug and crimp the wire lead to the lug. Now solder this wire. Place the tip of the hot soldering iron on the lug or terminal at a point close to the wire being soldered. Apply the solder to the junction of the lug, wire and soldering iron. When the lug and wire have been heated to the correct temperature, the solder will flow into and over the joint. Remove the iron when the solder starts to flow and remove the solder immediately after. Use only enough solder to cover the wire at the connection point.



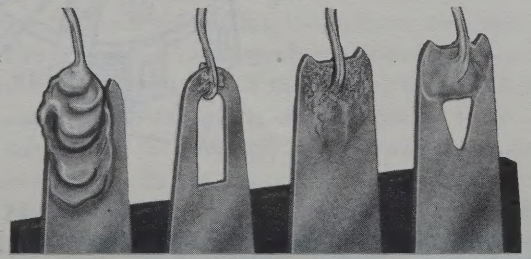
A. CRIMP LEAD TO TERMINAL FOR GOOD CONECTION



B. APPLY SOLDER TO LUG, WIRE AND IRON



C. USE CLIPS TO CONDUCT HEAT AWAY



A poor solder connection is obvious by its appearance. A grainy or pitted joint is a poor connection due to insufficient heat. Blobs of solder on the wire or solder lug is also due to insufficient heat. Solder should flow as a result of the heated lug and wire. Do not solder by applying solder to the iron tip and then wiping the hot solder onto the joint. A well soldered joint is indicated by a smooth bright finish on the soldered connection.

Construction Hints: The various lengths of wire to be used in the kit are specified in the construction steps. After cutting the wire to the length specified, strip the insulation off 1/4" from each end. The exposed wire will be used to make the actual connection to the solder lug.

Components, such as resistors, capacitors, transformers, etc., may have longer leads than specified. Cut the leads to the length indicated in the particular construction step. This length is to be measured from the body of the component. In the case of insulated leads, strip 1/4" of insulation off from the ends and twist the strands (if any) of the wire together.

As an example, one step may specify that each lead on a resistor be cut to 1/2". 1/4" of each lead is used to make a mechanical connection to the solder lug. The other 1/4" is between the socket and the component so that the component will not be overheated when soldering.

When a connection is indicated, a (C) or an (S) will appear next to the lug involved. The (C) indicates that the connection should be made mechanically, but is not to be soldered yet, since other leads are to be connected to this same lug. The (S) indicates that the connection should be made and soldered immediately. However, the (S) is always followed by a number, such as (S1), (S2), (S3), etc. This number indicates the number of connections made to the lug. It is a check on the accuracy of your work.

As an example, if it says (S3), you should count three leads going to the lug to be soldered. If there are less than three leads at this particular lug, you will know that you have forgotten one or more leads, or connected them to the wrong lugs. If there are more than three leads, you can be certain you have connected an extra wire to this lug, which should probably go elsewhere.

When you assemble the components in your unit, mark the symbol number of each socket and terminal strip near the part with a crayon. This will facilitate your wiring operation.

When wiring, lay the component in, close to the chassis, dressed as shown in the drawing. Be careful to avoid shorts at the lugs. The book is written so that the wiring closest to the chassis usually gets wired in first. The next layer of wires are to be soldered in next. In each case, dress the leads and components as close to the chassis as possible.

Next to each step number you will find a parenthesis ( ). After you have completed each step, make a check mark in the parenthesis so that you will have a record of your work. Follow the steps in the sequence written in the book. Do not skip steps or pages.

If any addendas are included in your book to modernize your instrument or make corrections or part substitutions, be sure to correct the Construction Book first before you start to wire or assemble your kit.

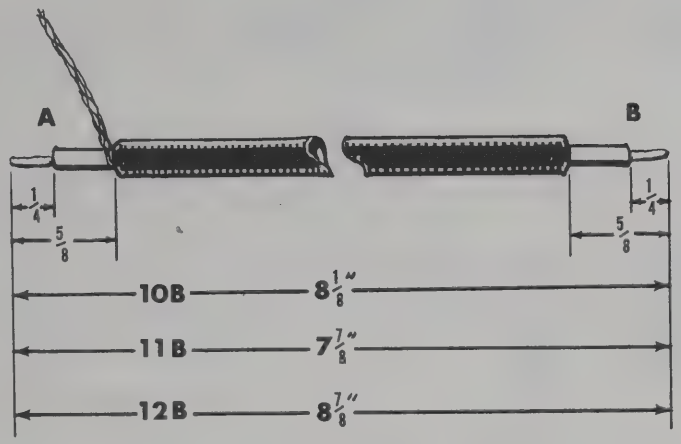
( ) 1. Three shielded cables must be prewired to the rotary switch S1, as shown in the Figure. Hold the switch as shown. When you hold the switch properly, the rear is toward you and the flat on the front shaft is facing to your right.

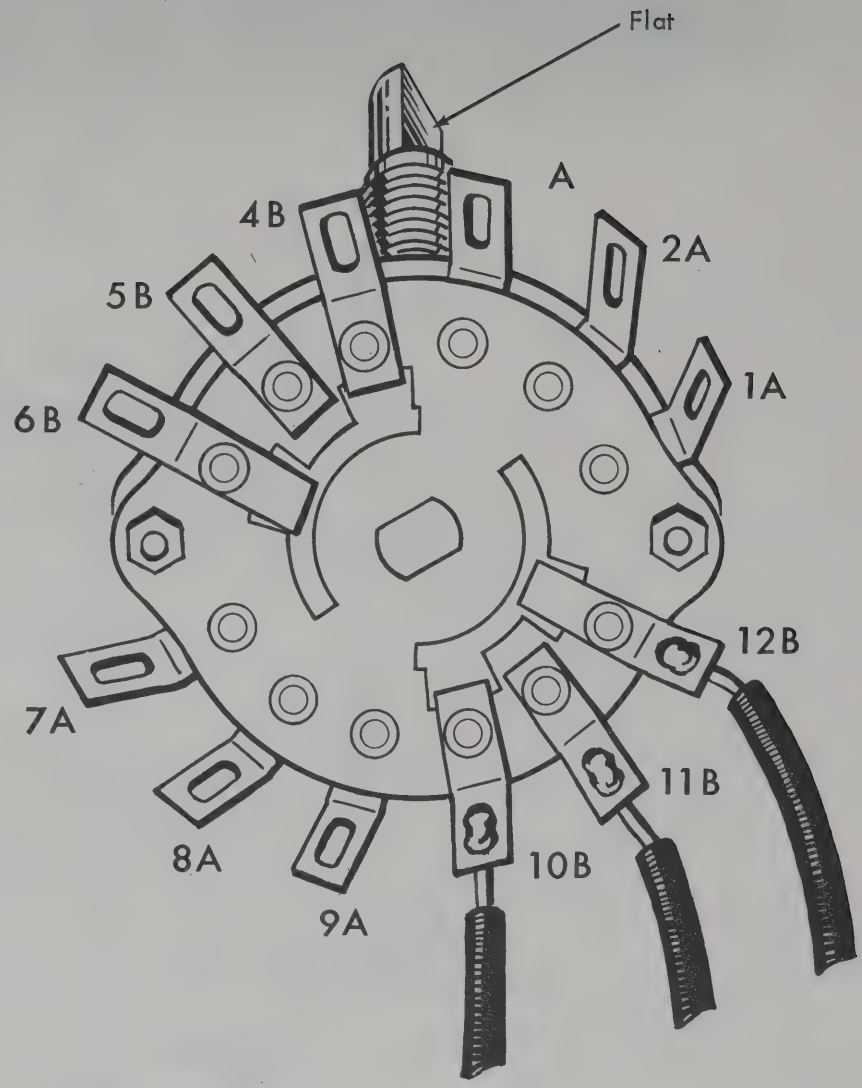
( ) 2. Cut one grey shielded cable to an 8 1/8" length, a second grey shielded cable to a 7 7/8" length and a third grey shielded cable to an 8 7/8" length.

( ) 3. On one end (referred to as end "A") of each of the three cables, strip the outer insulation back 5/8". On each cable individually gather the shield strands and twist them. Next strip back 1/4" of the inner insulation from end "A" of each cable.

( ) 4. On the other end (referred to as end "B") of each cable, strip the outer insulation back 5/8". On end "B" of each cable, gather all shield strands and cut them off at the outer insulation. Next, strip back 1/4" of the inner insulation from end "B" of each cable.

( ) 5. Connect the inner conductor from end "B" of the 8 1/8" shielded cable to S1-10B (S1). Connect the inner conductor from end "B" of the 7 7/8" shielded cable to S1-11B (S1). Connect the inner conductor from end "B" of the 8 7/8" shielded cable to S1-12B (S1).





TRANSMIT/RECEIVE S1 In Middle Position

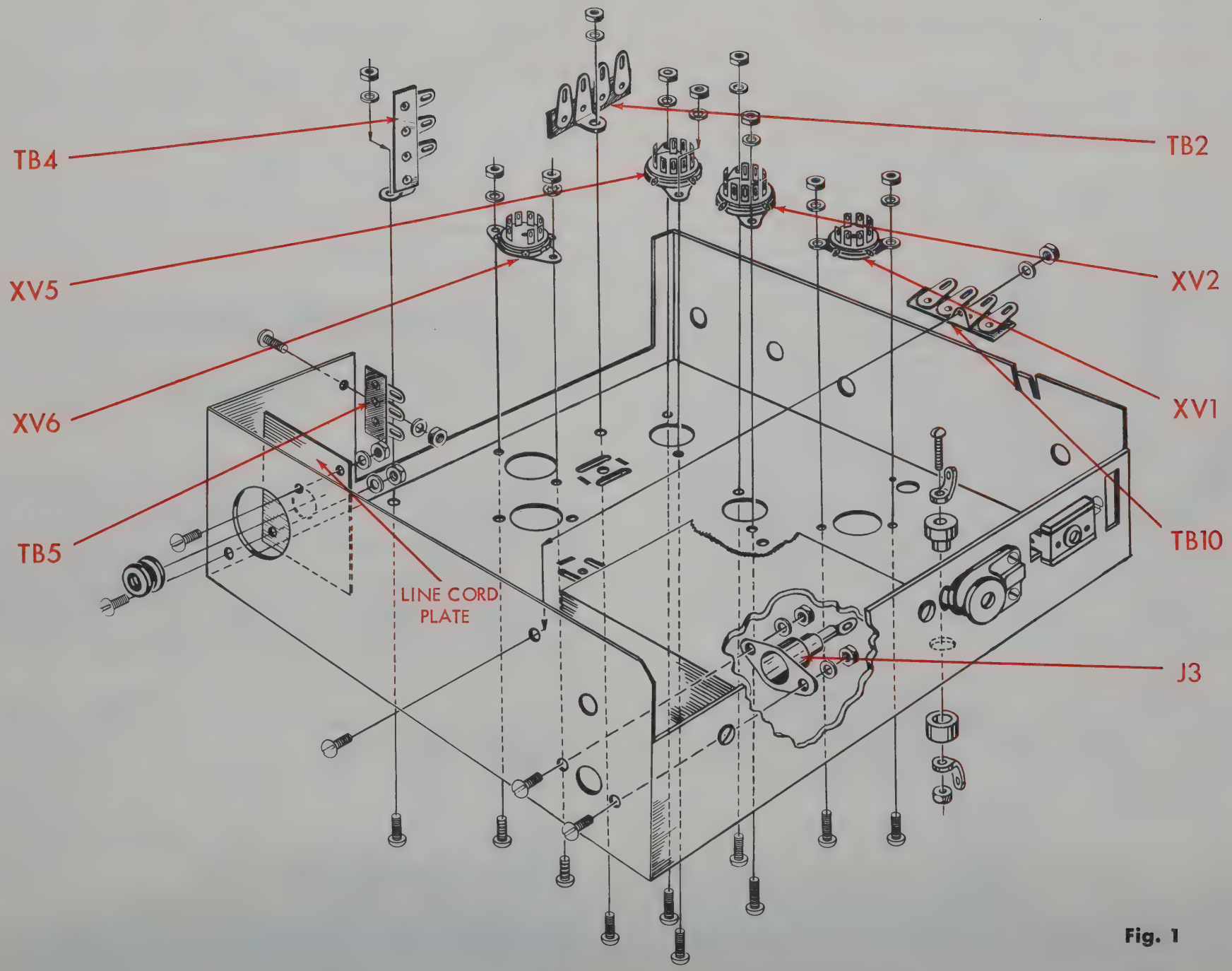


Fig. 1

MOUNTING INSTRUCTIONS

Several components have been mounted to the chassis and prewired. This has been done to best comply with FCC regulations. These components have been omitted from the figure in the interest of clarity.

( ) 1. Fig. 1. Mount the seven pin miniature socket XV1 from below the chassis as shown. Use two #4-40 x 1/4 screws, two #4 lockwashers and two #4-40 hex nuts. Note the orientation in Figure 4.

( ) 2. Fig. 1. Mount the nine pin miniature socket XV2 from below the chassis as shown. Use two #4-40 x 1/4 screws, two #4 lockwashers and two #4-40 hex nuts. Note the orientation in Figure 4.

( ) 3. Fig. 1. Mount the nine pin miniature socket XV5 from below the chassis as shown. Use two #4-40 x 1/4 screws, two #4 lockwashers and two #4-40 hex nuts. Note the orientation in Figure 4.

( ) 4. Fig. 1. Mount the seven pin miniature socket XV6 from below the chassis as shown. Use two #4-40 x 1/4 screws, two #4 lockwashers and two #4-40 hex nuts. Note the orientation in Figure 4.

( ) 5. Fig. 1. Mount the 3 post 2 right with ground terminal strip TB2 as shown. Use one #6-32 x 1/4 screw, one #6 lockwashers and one #6-32 hex nut. Note the orientation in Figure 4.

( ) 6. Fig. 1. Mount the 3 post upright-left terminal strip TB4 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6-32 hex nut. Note the orientation in Figure 4.

( ) 7. Fig. 1. Mount the 2 post with ground terminal strip TB5 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6-32 hex nut. Note the orientation in Figure 4.

( ) 8. Fig. 1. Mount the antenna jack, J3 as shown. Use two #4-40 screws, two #4 lockwashers and two #4-40 hex nuts.

( ) 9. Fig. 1. Mount the line cord plate on the rear apron of the chassis as shown. Use two #4-40 x 1/4 screws, two #4 lockwashers and two #4-40 hex nuts. Mount a 3/8" rubber grommet in the hole in the center of the plate.

( ) 10. Fig. 1. Mount the 3 post 2 left with ground terminal strip TB10 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6-32 hex nut. Note the orientation in Figure 4.

( ) 11. Fig. 1. The ceramic feed-through consists of two ceramic pieces. One is about 1/2" in diameter and 3/8" tall. It has a hole running through the center. The second piece has a 1/2" diameter for about 1/4" of its length and a smaller diameter for the rest of its length. The first of the two pieces fits over the smaller diameter on the second piece.

Push the portion of the second ceramic piece with the smaller diameter through the appropriate hole from below the chassis. Note that the chassis is shown with the bottom side facing up towards you. Put the first piece over the smaller diameter portion of the second piece, from above the chassis. Secure this ceramic feedthrough to the chassis using one #4-40 x 1" screw and one #4 hex nut. Under the head of the screw and under the hex nut, mount one #4 lug (2 lugs total), so that one lug is above the chassis and one lug is below the chassis.

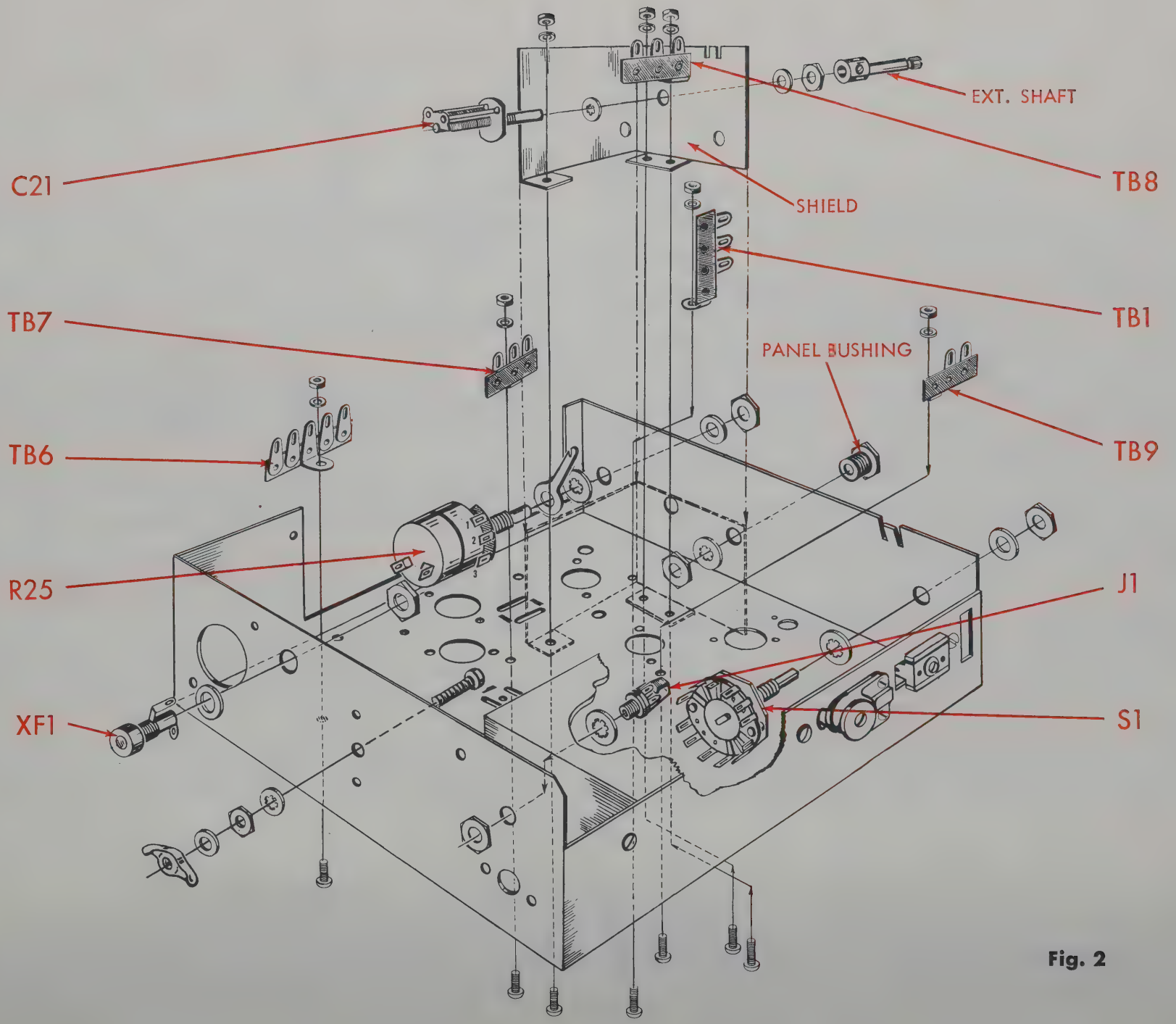

C21
EXT. SHAFT
TB8
SHIELD
TB1
TB7
PANEL BUSHING
TB9
TB6
R25
J1
XF1
S1

Fig. 2

MOUNTING INSTRUCTIONS

Note: The components mounted in Figure 1 have been omitted from Figure 2 in the interest of clarity.

( ) 1. Fig. 2. Mount fuseholder XF1 as shown. Use a 1/2" rubber washer between the fuseholder and the outside of the rear apron of the chassis. Secure the fuseholder to the chassis using a 1/2" hex nut.

( ) 2. Fig. 2. Mount meter jack J1 on the rear apron of the chassis as shown. Use one #3/8-32 hex nut and one 3/8 lockwasher.

( ) 3. Fig. 2. Mount the variable capacitor C21 to the shield as shown. Use a 1/4" lockwasher between the capacitor and the shield. Use a 1/4" flatwasher and 1/4" hex nut to secure the capacitor to the shield. Note the orientation in the figure. It is shown with the plates fully meshed (maximum capacity). The curved portion of the plates face up in the drawing.

( ) 4. Fig. 2. Mount the panel bushing through the center hole in the front apron of the chassis. Use one 3/8" lockwasher and one 3/8" hex nut. Do not tighten too much since this bushing will be removed later when the panel will be mounted.

( ) 5. Fig. 2. Mount the extension shaft onto the shaft of capacitor C21. Push extension shaft as far as it will go towards the capacitor. Screw the two #6-32 x 1/8 set screws into the two holes in extension shaft. Tighten the two set screws so that the extension shaft will hold firmly onto the shaft of the capacitor.

( ) 6. Fig. 2. Mount the shield assembly to the chassis as shown. First pass the extension shaft through the panel bushing. Next place the shield on the chassis so that the mounting holes in the shield line up properly with the appropriate mounting holes in the chassis. The broken lines show the proper mounting position of the shield. Secure the shield to the chassis with three #4-40 x 1/4 screws, three #4 lockwashers and three #4-40 hex nuts. Under one of the lockwashers, mount the 2 post right with ground terminal strip TB8.

( ) 7. Fig. 2. Mount the 1MΩ potentiometer R25, as shown. Use a pot grounding lug and a 3/8 lockwasher inside the chassis noting the sequence in fig. 2. Use a 3/8 flatwasher and 3/8 hex nut outside of the chassis. Position the pot grounding lug so that it is opposite pin #1 on the potentiometer. It is eventually to be soldered to this lug. Do not tighten too much since the hex nut and flatwasher will be removed later when the panel will be mounted.

( ) 8. Fig. 2. The rotary switch S1 has three positions, It will not remain in its first position due to the action of a spring. It will however remain in its second and third positions. Put this switch in the middle position -- 2. Mount the switch to the front apron of the chassis. The switch is mounted properly when the flat on the shaft is facing the nearest side of the chassis. Use a 3/8 lockwasher between the switch and the chassis. Use a 3/8 flatwasher and a 3/8 hex nut to secure the switch to the chassis. Do not tighten too much since the hex nut and flat washer will be removed later when the panel will be mounted. Check the lugs on the switch near the chassis and bend them if necessary, so that they do not short against chassis.

( ) 9. Fig. 2. Mount the three post upright left terminal strip TB1 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6 hex nut.

( ) 10. Fig. 2. Mount the four post with ground terminal strip TB6 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6 hex nut.

( ) 11. Fig. 2. Mount the two post with ground terminal strip TB7 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6 hex nut.

( ) 12. Fig. 2. Mount the two post left with ground terminal strip TB9 as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6 hex nut.

( ) 13. Fig. 2. Secure a #10-32 x 1/2 screw to the inside of the rear apron of the chassis, as shown, using one #10 lockwasher and one #10-32 hex nut. Put one #10 flatwasher and one #10-32 wing nut on the threaded portion of the screw protruding outside the chassis. This will eventually be used as ground terminal.

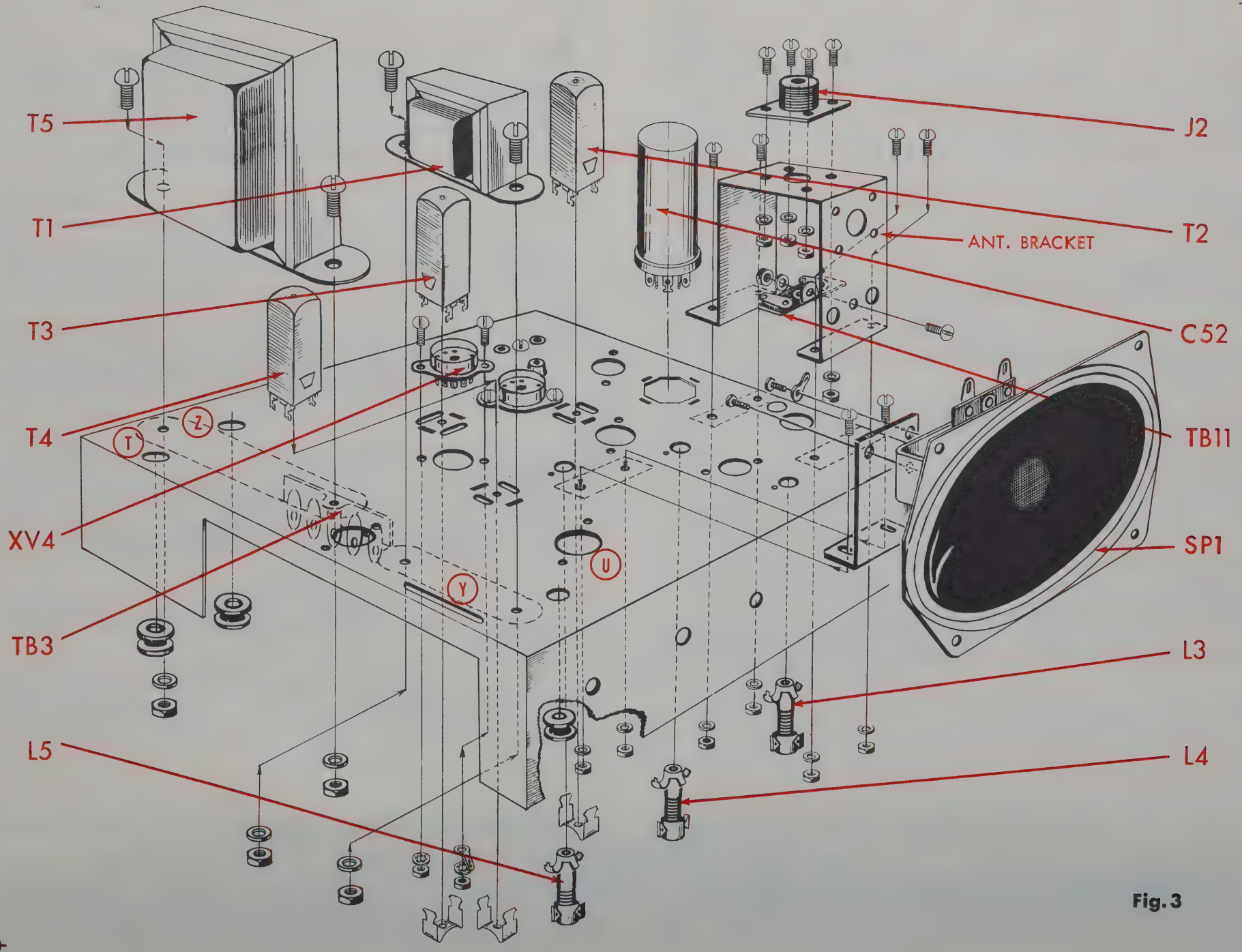


Fig. 3

MOUNTING INSTRUCTIONS

Note: The components mounted in Figures 1 and 2 have been omitted from Figure 3 in the interest of clarity.

( ) 1. Fig. 3. Mount the Antenna Bracket as shown. Use four #6-32 x 1/4 screws, four #6 lockwashers and four #6-32 hex nuts.

( ) 2. Fig. 3. Mount the 2 post terminal strip TB11 to the Antenna Bracket as shown. Use one #6-32 x 1/4 screw, one #6 lockwasher and one #6-32 hex nut.

( ) 3. Fig. 3. Mount the antenna receptacle J2 to the Antenna Bracket as shown. Use four #4-40 x 3/8 screws, four #4 lockwashers and four #4-40 hex nuts.

( ) 4. Fig. 3. Mount the 40-40-40mfd/350-350-250 volt electrolytic capacitor C52 as shown. Note the orientation of the capacitor (half-moon, square and triangle) in Figure 4. Insert the capacitor mounting tabs into the slots in the chassis and twist the tabs a little less than a quarter turn. Do not twist the tabs excessively or they will shear off. Solder the capacitor tabs without a hole to the chassis at the slot in the chassis.

( ) 5. Fig. 3. Mount the nine pin miniature socket with shield support XV4 from the top of the chassis as shown. Use two #4-40 x 1/4 screws, two #4 lockwashers, one #4 ground lug and two #4-40 hex nuts as shown.

( ) 6. Fig. 3. Mount the three 3/8" rubber grommets in the appropriate holes T, U, Z, in the chassis.

( ) 7. Fig. 3. Mount the power transformer (with end bells) T5 to the chassis as shown. Push the black and black-white leads through the rubber grommet in hole "T" in the chassis and all the remaining leads through the rubber grommet in hole "Z" in the chassis. Secure to the chassis using two #6-32 x 3/8" screws, two #6 lockwashers and two #6-32 hex nuts. Under one of the lockwashers mount the 4 post with ground terminal strip TB3.

( ) 8. Fig. 3. Mount the modulation transformer T1 as shown. Orient so that the green lead goes through the rubber grommet in the chassis and all other leads pass through the slot near the side of the chassis. Secure the transformer to the chassis using two #6-32 x 3/8 screws, two #6 lockwashers and two #6-32 hex nuts.

( ) 9. Fig. 3. The stock number of each IF transformer can is stamped on the side of the can. Mount the rectangular IF can T2 (stock #34615) and orient the color dot terminal as shown in fig. 4. Use the special brass clip provided to hold the can. Push the plastic at the bottom of the can (in which the solder lugs are mounted) through the longer two of the four elongated slits which surround the round hole. When this is done, the can stands on the top of the chassis. From the bottom of the chassis, insert the brass clip through the two remaining elongated slits, by spreading the clip apart slightly. Next, push one side of the clip up far enough so that it will catch in the "Y" shaped hole at the side of the can. Hold the can firmly against the top of the chassis with one hand. With the index finger of the other hand, working from the bottom of the chassis, push the clip up until it "clicks" into the remaining "Y" shaped hole in the other side of the can.

( ) 10. Fig. 3. Mount the rectangular IF can T3 (stock #34616) and orient as shown in Figure 4. Using the special brass clip, secure the can to the chassis following the procedure outlined in step 9 above.

( ) 11. Fig. 3. Mount the rectangular IF can T4 (stock #34617) and orient as shown in Figure 4. Using the special brass clip, secure the can to the chassis following the procedure outlined in step 9 above.

( ) 12. Fig. 3. Three coils wound on 1/4" forms are supplied with the kit. Coil L4 has 2 solder lugs while coils L3 and L5 have three solder lugs each. Coil L3 can be differentiated from coil L5. Coil L3 has a longer winding -- more turns of wire -- than coil L5.

Mount coil L4 from below the chassis. Note that next to the mounting hole is a small hole. This hole is used as the key for orienting the coil. On the metal bracket mounted to the coil, you will find two pieces of metal bent at right angles to the coil form. On one of these pieces of metal, you will find two lugs and on the second, you will find three lugs. The center one of the three lugs is used as a locating lug. When the coil is oriented properly, this center lug fits into the locating hole which is next to the mounting hole in the chassis. When the proper orientation has been determined, push the metal bracket on the coil form through the mounting hole in the chassis and the locating lug through the locating hole next to the mounting hole. Press until you hear two clicks and the coil is held firmly to the chassis.

( ) 13. Fig. 3. Following the procedure outlined in step 12, mount coil L5 (3 lugs with shorter winding). Orient the coil form so that the locating lug fits into the locating hole.

( ) 14. Fig. 3. Following the procedure outlined in step 12, mount coil L3. Orient the coil form so that the locating lug fits into the locating hole.

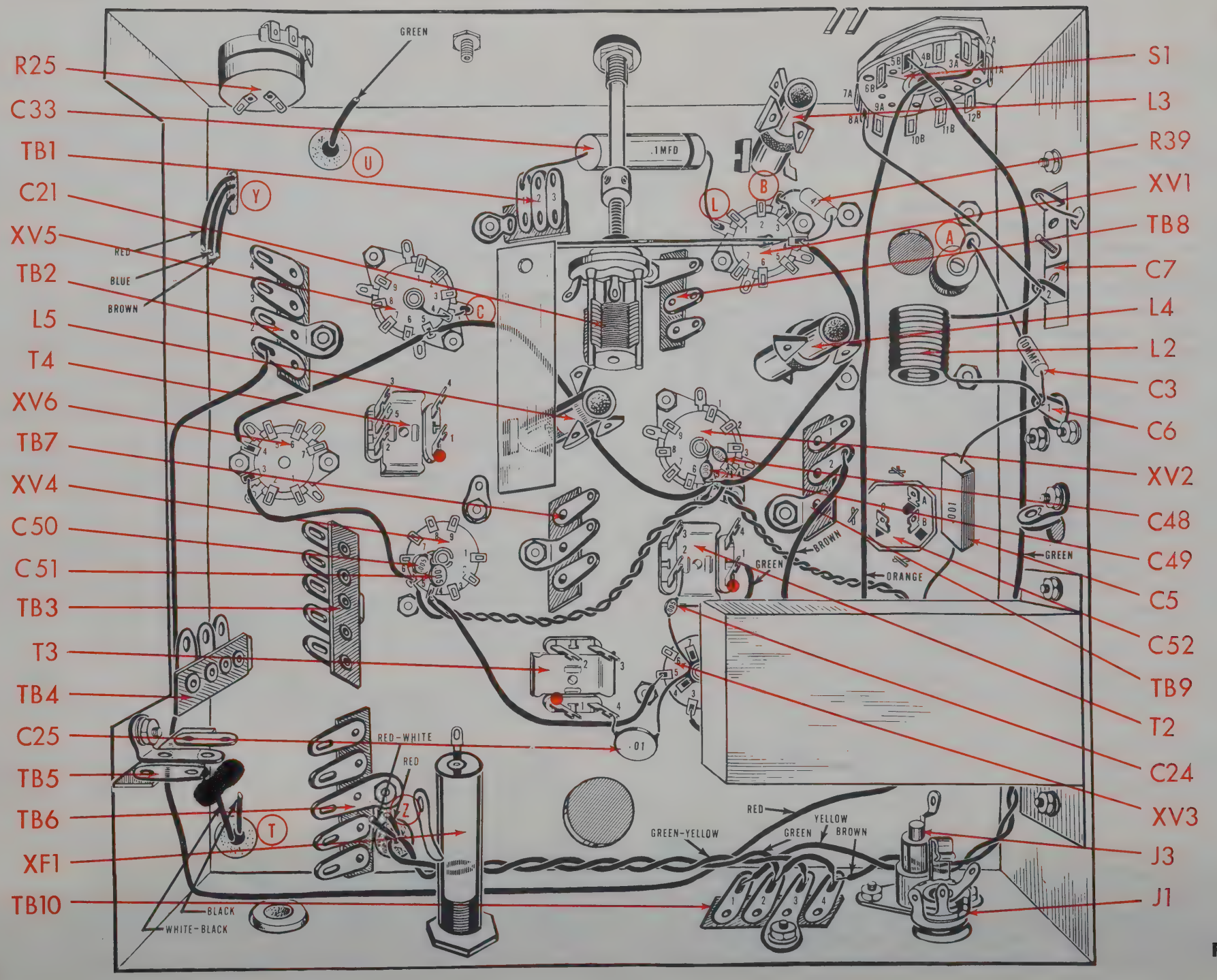

R25
C33
TB1
C21
XV5
TB2
L5
T4
XV6
TB7
XV4
C50
C51
TB3
T3
TB4
C25
TB5
TB6
XF1
TB10
S1
L3
R39
XV1
TB8
C7
L4
L2
C3
C6
XV2
C48
C49
C5
C52
TB9
T2
C24
XV3
J3
J1
GREEN
RED
BLUE
BROWN
.1MFD
RED-WHITE
RED
BLACK
WHITE-BLACK
GREEN-YELLOW
YELLOW
GREEN
BROWN
ORANGE
100MMF
.01

Fig. 4

WIRING

( ) 1. Fig. 4. From the prewired section, there are two twisted pairs of brown and yellow wires. One of these pairs emerge towards the rear of the chassis near jacks J1 and J3. From this pair, connect the yellow wire to TB10-1 (S1) and the brown wire to TB10-4 (C).

( ) 2. Fig. 4. Connect a 1 1/4" piece of brown wire from TB10-4 (S2) to TB10-2 (C).

( ) 3. Fig. 4. From hole "Z", run the green and green-yellow leads along the chassis as shown. Connect the green-yellow lead to TB10-3 (S1) and the green lead to TB10-2 (S2).

( ) 4. Fig. 4. From the prewired section under the shield cover, connect the red lead to TB2-1 (C), the orange lead to S1-2A (S1), the brown lead to TB9-2 (C), the long green lead to S1-5B (S1) and the short green lead to T2-1 (S1). Run each of these leads along the chassis as shown.

( ) 5. Fig. 4. From socket XV3-5, connect the yellow lead to XV4-4 (C).

( ) 6. Fig. 4. From the prewired section under the shield cover, connect the brown wire from the remaining twisted brown and yellow pair to XV2-4 (C) and the yellow wire to XV2-5 (C).

( ) 7. Fig. 4. Connect the free lead from the 10mmf disc capacitor C3 to lug "A" (S1) at the feed-through insulator.

( ) 8. Fig. 4. Connect the free end of the bare wire from C7-2 to S1-8A (S1).

( ) 9. Fig. 4. Connect the free lead from the .005mfd (5K or 5000mmf) disc capacitor C24 to T2-2 (C).

( ) 10. Fig. 4. Connect the free lead from the .01mfd (10K or 10,000mmf) disc capacitor C25 to T3-4 (C).

( ) 11. Fig. 4. Connect one end of a 4" piece of brown wire to XV2-4 (C) and one end of a 4" piece of yellow wire to XV2-5 (C). Twist the wires together and run them along the chassis as shown. Connect the other end of the brown wire to XV4-5 (C) and the other end of the yellow wire to XV4-4 (C).

( ) 12. Fig. 4. Connect a 3 1/2" piece of brown wire from XV4-5 (C) to XV6-3 (S1).

( ) 13. Fig. 4. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C50 to 1/2". Connect from XV4-5 (S3) to the center post (C) on XV4. Dress so that capacitor stands upright perpendicular to the chassis.

( ) 14. Fig. 4. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C51 to 1/2". Connect XV4-4 (S3) to the center post (C) on XV4. Dress so that the capacitor stands upright perpendicular to the chassis.

( ) 15. Fig. 4. Connect a 3 1/2" piece of yellow wire from XV2-5 (C) to XV1-4 (C). Bend lug XV1-4 towards the chassis. It should not touch or short against the chassis.

( ) 16. Fig. 4. Connect a 4 1/2" piece of yellow wire from XV2-5 (C) to XV5-5 (C).

( ) 17. Fig. 4. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C49 to 1/2". Connect from XV2-5 (S5) to the center post (C) on XV2. Dress so that the capacitor stands upright perpendicular to the chassis.

( ) 18. Fig. 4. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C48 to 1/2". Connect from XV2-4 (S3) to the center post (C) on XV2. Dress so that the capacitor stands upright perpendicular to the chassis.

( ) 19. Fig. 4. Cut both leads on a 0.1mfd (brown, black, yellow, white, yellow) capacitor C33 to 3/4". Connect from ground lug "L" (S1) to TB1-1 (C). Dress the capacitor close to the chassis under the extension shaft of the variable capacitor C21.

( ) 20. Fig. 4. Cut both leads on a 47Ω (yellow, violet, black, silver) 1 watt resistor, R39, to 5/8". Connect from XV1-4 (S2) to ground lug "B" (C).

( ) 21. Fig. 4. Connect a 1/2" piece of bare wire from XV1-3 (S1) to ground lug "B" (S2). Bend lug XV1-3 towards the chassis. Do not touch or short the lug to chassis.

( ) 22. Fig. 4. Connect a 4" piece of yellow wire from XV6-4 (S1) to XV5-5 (S2).

( ) 23. Fig. 4. Connect a 1" piece of bare wire from ground lug "C" (S1) at XV5 through XV5-4 (S1) to the center post (C) on XV5. Bend lug XV5-4 towards the chassis.

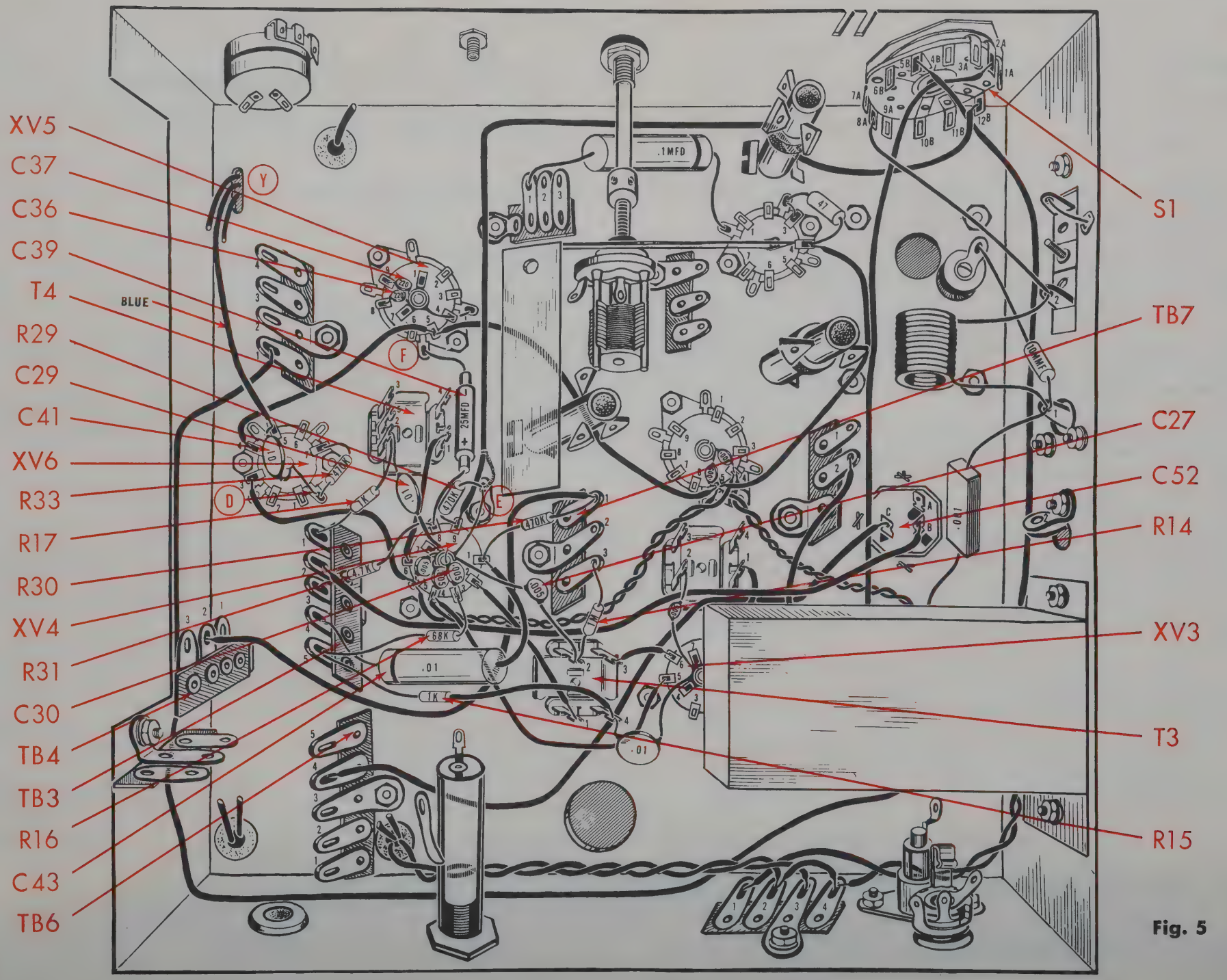

XV5
C37
C36
C39
T4
R29
C29
C41
XV6
R33
R17
R30
XV4
R31
C30
TB4
TB3
R16
C43
TB6
S1
TB7
C27
C52
R14
XV3
T3
R15
BLUE
.1MFD
25MFD
10MFD
.041
.005
.01
68K
47K
4.7K
1K
10K
470K
Y
F
D
E

Fig. 5

( ) 1. Fig. 5. Cut both leads on a 220mmf disc capacitor C37 to 1/2". Connect from XV5-9 (C) to the center post (C) on XV5.

( ) 2. Fig. 5. Cut both leads on a 220mmf disc capacitor C36 to 1/2". Connect from XV5-8 (C) to the center post (C) on XV5.

( ) 3. Fig. 5. Bend lugs XV5-1 and XV5-7 towards the center post. Solder the lugs and all other connections going to the center post on XV5. There are five (5) items to be soldered to this post.

( ) 4. Fig. 5. Cut both leads on a 470K (yellow, violet, yellow, silver) resistor R33 to 1/2". Connect from XV6-7 (S1) to ground lug "D" (C) at XV6.

( ) 5. Fig. 5. Connect a 1" piece of bare wire from ground lug "D" (S2) to the center post (C) on XV6. Dress wire so that it does not short to any of the lugs on XV6.

( ) 6. Fig. 5. Connect the blue lead from hole "Y" to XV6-5 (C).

( ) 7. Fig. 5. Cut both leads on the .01mfd (10K or 10,000mmf) disc capacitor C41 to 1/2". Connect from XV6-5 (S2) to the center post (S2) on XV6.

( ) 8. Fig. 5. The center inner conductor on one end of a shielded cable has been prewired to lug S1-12B on the switch. On the other end of the cable, twist the shield strands together and connect to lug "E" (C). Connect the inner conductor to XV4-9 (C).

( ) 9. Fig. 5. Cut both leads on a 470K (yellow, violet, yellow, silver) resistor R29 to 5/8". Connect from XV4-9 (S2) to ground lug "E" (C).

( ) 10. Fig. 5. Connect a 1" piece of bare wire from ground lug "E" (S3) to the center post (C) on XV4. Dress the wire so that it does not short to any of the lugs on XV4.

( ) 11. Fig. 5. Connect a 1 1/2" piece of green wire from XV4-6 (S1) to T4-1 (S1).

( ) 12. Fig. 5. Cut both leads on a 25mfd electrolytic capacitor C39 to 3/4". Connect the positive lead to XV4-8 (C) and the negative lead to ground lug "F" (C) on XV5.

( ) 13. Fig. 5. Cut both leads on a 4.7K (yellow, violet, red, silver) resistor R31 to 5/8". Connect from XV4-8 (S2) to TB3-3 (C).

( ) 14. Fig. 5. Connect a 1 1/2" piece of green wire from XV4-2 (S1) to T3-1 (S1).

( ) 15. Fig. 5. Connect a 7 1/2" piece of red wire from C52-C (S1) to TB6-4 (C).

( ) 16. Fig. 5. Connect a 7" piece of red wire from TB3-2 (C) to C52-B (S1).

( ) 17. Fig. 5. Connect a 6" piece of red wire from TB7-1 (C) to TB4-2 (C).

( ) 18. Fig. 5. Cut both leads on a 470K (yellow, violet, yellow, silver) resistor R30 to 5/8". Connect from XV4-1 (C) to TB7-1 (S2).

( ) 19. Fig. 5. Cut both leads on a .01mfd (brown, black, orange, white, blue) molded capacitor C43 to 1". Connect the outside foil end (indicated by ring or printing "gnd", "ground" or "outside foil") to TB3-4 (C). Cover the remaining lead with a 3/4" piece of spaghetti and connect to XV4-1 (S2).

( ) 20. Fig. 5. Cut all leads on a 68K (blue, grey, orange, silver) resistor R16 to 5/8". Connect from XV4-3 (C) to TB3-5 (C).

( ) 21. Fig. 5. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C30 to 1/2". Connect from XV4-3 (S2) to the center post on XV4.

( ) 22. Fig. 5. Bend lug XV4-7 to the center post on XV4.

( ) 23. Fig. 5. Cut both leads on a 1M (brown, black, green, silver) resistor R14 to 1/2". Connect from T3-2 (C) to TB7-3 (C).

( ) 24. Fig. 5. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C27 to 5/8". Connect from T3-2 (S2) to the center post (C) on XV4.

( ) 25. Fig. 5. Cut both leads on a 1K (brown, black, red, silver) resistor R17 to 1/2". Connect from T4-2 (C) to TB3-1 (C).

( ) 26. Fig. 5. Cut both leads on a .01mfd (10K or 10,000mmf) disc capacitor C29 to 5/8". Connect one end to T4-2 (S2). Cover the remaining lead with a 3/8" piece of spaghetti and connect to the center post (S7) on XV4.

( ) 27. Fig. 5. Connect a 1" piece of green wire from XV3-6 (S1) to T3-3 (S1).

( ) 28. Fig. 5. Cut both leads on a 1K (brown, black, red, silver) resistor R15 to 1 1/4". Cover one lead with a 1" piece of spaghetti and connect to T3-4 (S2). Connect the remaining lead to TB3-5 (C).

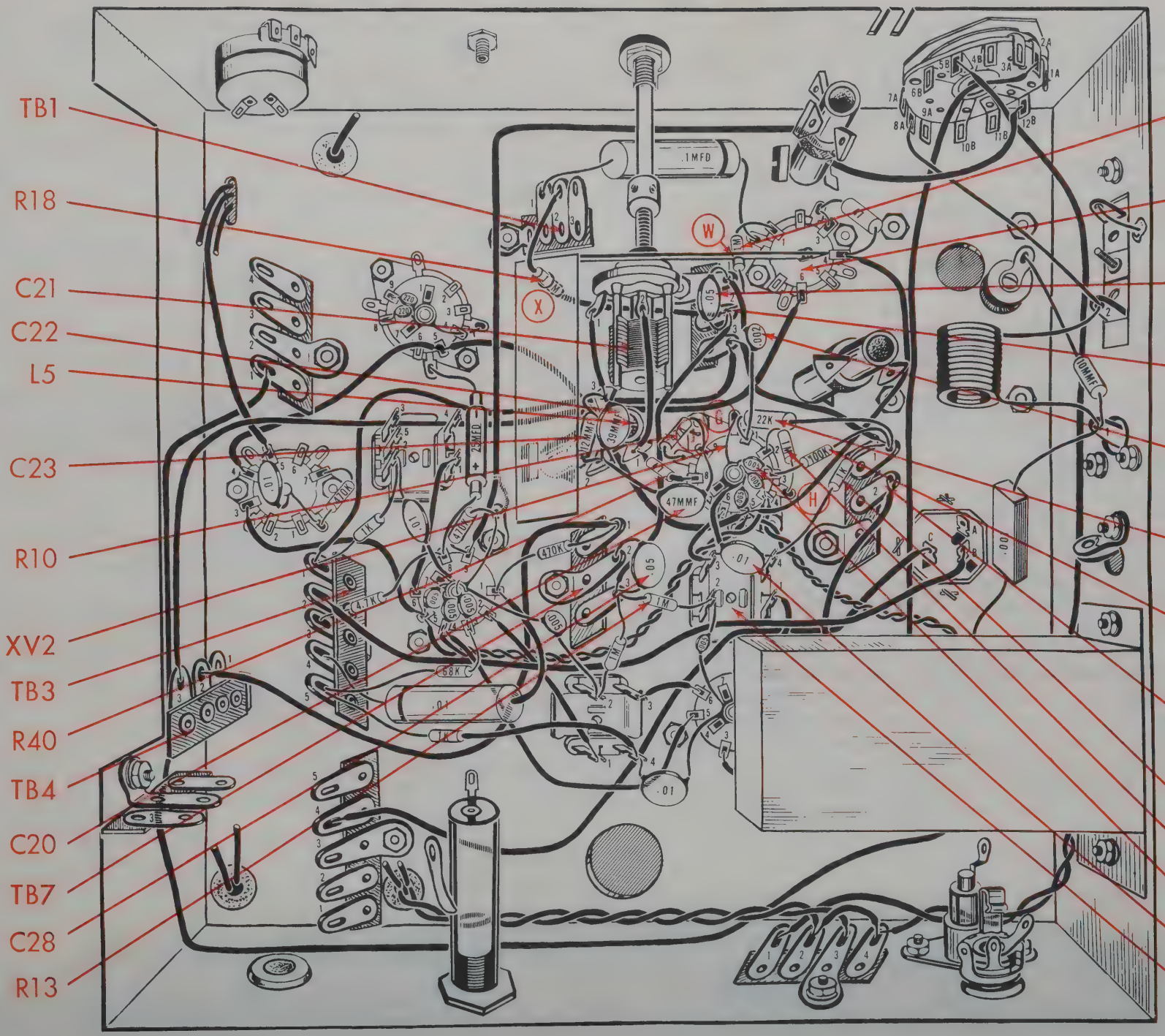

TB1
R18
C21
C22
L5
C23
R10
XV2
TB3
R40
TB4
C20
TB7
C28
R13
R5
XV1
C13
TB8
C19
R9
R7
TB9
R11
R8
C16
C18
T2
W
X
H
.1MFD
47MMF
470K
22K
68K
1K
.01
.05
.001
25MFD
10MMF

Fig. 6

CHASSIS WIRING

( ) 1. Fig. 6. Connect a 3/4" piece of bare wire from XV2-6 (S1) to T2-3 (S1).

( ) 2. Fig. 6. Connect a 1" piece of bare wire from ground lug "G" (S1) to the center post (C) on XV2. Dress the wire so that it does not short to any of the lugs on XV2.

( ) 3. Fig. 6. Cut both leads on a 1M (brown, black, green, silver) resistor R8 to 1/2". Connect from XV2-2 (C) to ground lug "H" (S1). Dress the resistor close to the chassis.

( ) 4. Fig. 6. Cut both leads on a 47K (yellow, violet, orange, silver) resistor R10 to 1/2". Connect from ground lug "J" (S1) to XV2-9 (C).

( ) 5. Fig. 6. Connect a 2-3/4" piece of red wire from TB9-1 (C) to TB8-3 (C).

( ) 6. Fig. 6. Connect a 5" piece of red wire from TB8-3 (C) to TB3-1 (C). Run the wire along the chassis under the shield as shown.

( ) 7. Fig. 6. Connect a 10" piece of red wire from XV1-6 (C) to TB4-3 (C). Run the wire along the chassis under the shield as shown.

( ) 8. Fig. 6. Cut both leads on a 22K (red, red, orange, silver) 1 watt resistor, R9 to 5/8". Connect from XV2-1 (C) to TB9-1 (C).

( ) 9. Fig. 6. Cut both leads on a .002mfd (2K or 2000mmf) disc capacitor C19 to 3/4". Connect one end to XV2-1 (S2). Cover the second lead with a 1/2" piece of spaghetti and connect to TB8-1 (C).

( ) 10. Fig. 6. Connect a 3 3/4" piece of yellow wire from TB7-3 (C) to TB8-2 (C).

( ) 11. Fig. 6. Cut both leads on a 1M (brown, black, green, silver) resistor R13 to 5/8". Connect from T2-2 (S2) to TB7-3 (C).

( ) 12. Fig. 6. Cut both leads on a .05mfd (50K or 50,000mmf) disc capacitor C28 to 1/2". Connect from TB7-3 (S4) to TB7-2 (S1).

( ) 13. Fig. 6. Cut both leads on a 47mmf disc capacitor C20 to 5/8". Connect from XV2-9 (S2) to L5-2 (C).

( ) 14. Fig. 6. Cut both leads on a 47Ω (yellow, violet, black, silver) 1/2 watt resistor R40 to 5/8". Connect from XV2-8 (C) to L5-1 (C).

(X) 15. Fig. 6. Connect a 1" piece of bare wire covered with a 3/4" piece of spaghetti from L5-1 (S2) to C21-2 (S1). Avoid letting solder flow into variable capacitor C21.

( ) 16. Fig. 6. Cut both leads on a 39mmf disc capacitor C22 to 5/8". Connect from ground lug L5-3 (C) to L5-2 (C).

( ) 17. Fig. 6. Cut both leads on the 1M (brown, black, green, silver) resistor R18 to 1 1/2". Cover both leads with a 1 1/4" piece of spaghetti. Center the resistor in hole "X". Connect from TB8-2 (C) to TB1-2 (C).

( ) 18. Fig. 6. Cut both leads on the 1M (brown, black, green, silver) resistor R5 to 5/8". Connect from XV1-1 (C) to TB8-2 (C). Center the resistor in hole "W".

( ) 19. Fig. 6. Cut both leads on a .05mfd (50K or 50,000mmf) disc capacitor C13 to 1/2". Connect from TB8-2 (S4) to TB8-1 (S2).

(X) 20. Fig. 6. Connect a 1 1/4" piece of green wire from C21-1 (S1) to L5-3 (C).

( ) 21. Fig. 6. Cut both leads on a 12mmf N-750 tubular capacitor C23 to 5/8". Connect from L5-2 (S3) to L5-3 (S3).

( ) 22. Fig. 6. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C16 to 1/2". Connect from XV2-3 (C) to the center post (C) on XV2.

( ) 23. Fig. 6. Cut both leads on the 100K (brown, black, yellow, silver) resistor R7 to 5/8". Connect from XV2-3 (S2) to TB9-1 (C).

( ) 24. Fig. 6. Cut both leads on a 1K (brown, black, red, silver) resistor, R11 to 3/4". Connect from TB9-1 (C) to T2-4 (C).

( ) 25. Fig. 6. Cut both leads on a .01mfd (10K or 10,000mmf) disc capacitor C18 to 5/8". Connect one lead to T2-4 (S2). Cover the remaining lead with a 3/8" piece of spaghetti and connect to the center post (C) on XV2.

( ) 26. Fig. 6. Bend the lug XV2-7 toward the center post on XV2. Solder all six components (including lugs and leads) to this center post (S6).

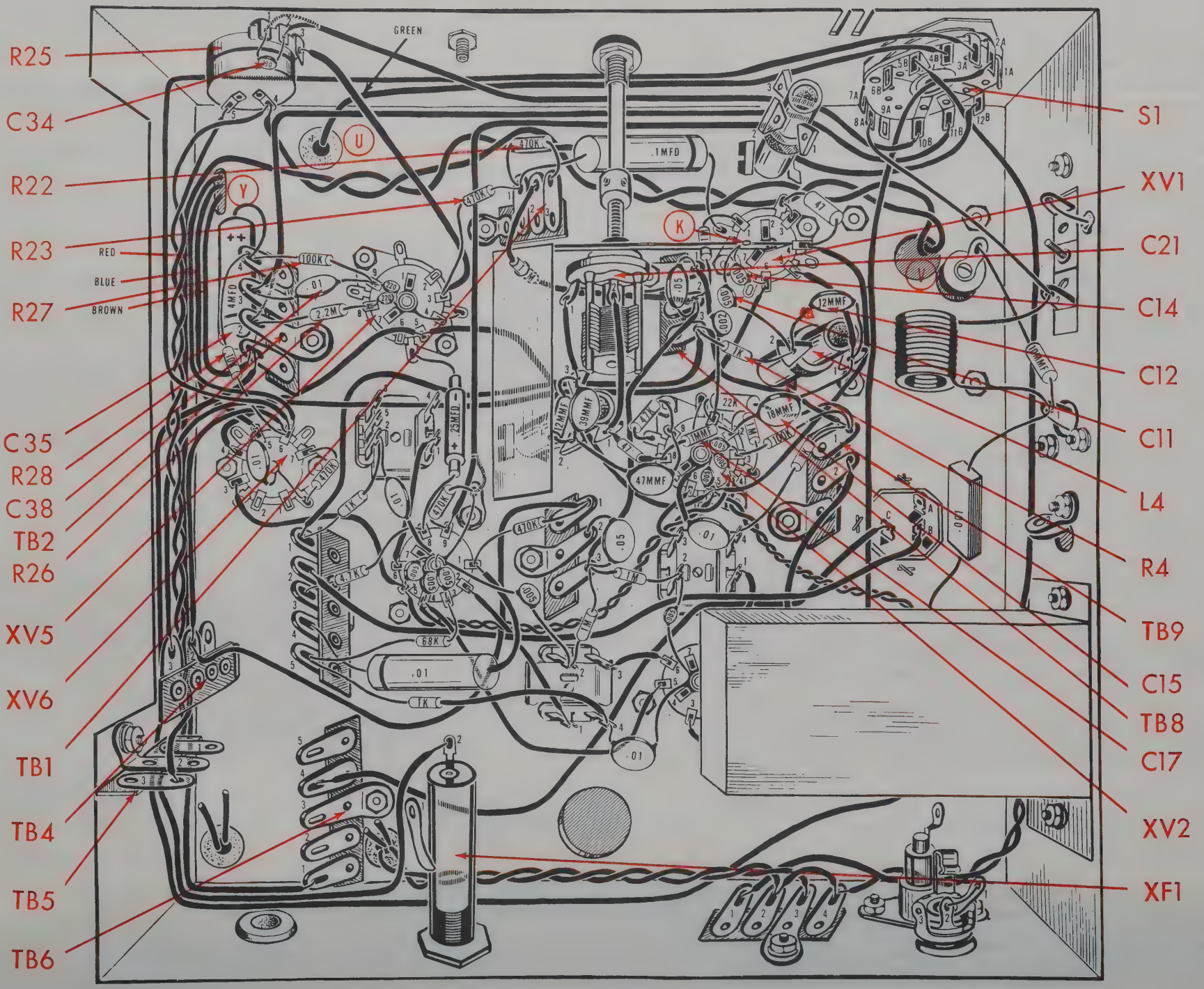

R25
C34
R22
R23
R27
C35
R28
C38
TB2
R26
XV5
XV6
TB1
TB4
TB5
TB6
S1
XV1
C21
C14
C12
C11
L4
R4
TB9
C15
TB8
C17
XV2
XF1
GREEN
RED
BLUE
BROWN
U
Y
K
V
470K
.1MFD
100K
.01
2.2M
4MFD
25MFD
1K
10
.05
.005
.001
12MMF
39MMF
47MMF
18MMF
100MMF
22K
1MMF
.1
68K
4.7K
1M
.02
.04
.5
2A
1A
3A
4B
5B
6B
7A
8A
9A
10B
11B
12B

Fig. 7

CHASSIS WIRING

( ) 1. Fig. 7. Cut both leads on a 1mmf cylindrical ceramic capacitor C17 to 1/2". Connect from XV2-8 (S2) to XV2-2 (C).

( ) 2. Fig. 7. Cut both leads on the 18mmf disc capacitor C15 to 5/8". Connect from XV2-2 (S3) to L4-1 (C).

( ) 3. Fig. 7. Cut both leads on a 1K (brown, black, red, silver) resistor R4 to 1/2". Connect from TB8-3 (S3) to L4-2 (C).

( ) 4. Fig. 7. Bend lugs XV1-2 and XV1-7 to center post on XV1. Solder the lugs and the center post to shield.

( ) 5. Fig. 7. Connect a 1 1/4" piece of green wire from XV1-5 (S1) to L4-1 (C).

( ) 6. Fig. 7. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C14 to 5/8". Connect from XV1-6 (S2) to the tab "K" (C) on the shield.

( ) 7. Fig. 7. Cut both leads on a .005mfd (5K or 5000mmf) disc capacitor C11 to 5/8". Connect from L4-2 (C) to tab "K" (C) on the shield.

( ) 8. Fig. 7. Cut both leads on a 12mmf disc capacitor C12 to 1/2". Connect from L4-2 (S3) to L4-1 (S3).

( ) 9. Fig. 7. Strip the insulation back 1/4" from both ends of a 15 1/2" piece of black wire. Connect one end to TB6-1 (C). Run this lead along the chassis toward R25. Strip the insulation back 1/4" from both ends of a 7 1/2" piece of yellow wire. Connect one end to R25-4 (C). Twist the two wires together and run along the chassis as shown, under the shaft of variable capacitor C21. Push this twisted pair through hole "V".

( ) 10. Fig. 7. Connect one end of an 8" piece of brown wire to R25-5 (S1) and one end of a 7" piece of orange wire to R25-4 (S2). Twist the two leads together. Connect the remaining end of the orange lead to TB5-3 (C) and the remaining end of the brown wire to XF1-2 (S1).

( ) 11. Fig. 7. The inner conductor from one end of a shielded cable has been prewired to S1-10B. On the other end of the shielded cable, twist the shield strands together and connect to R25-1 (C). Connect the inner conductor to R25-2 (C). Run the cable under the shaft of the variable capacitor C21 as shown.

( ) 12. Fig. 7. Cut both leads on a 330mmf disc capacitor C34 to 1/2". Connect from R25-2 (S2) to R25-1 (S3). Be certain that the capacitor as well as the pot grounding lug is soldered to R25-1.

( ) 13. Fig. 7. Connect a 2 1/2" piece of green wire from R25-3 (S1) to XV5-3 (C).

( ) 14. Fig. 7. The inner conductor on one end of a shielded cable has been prewired to S1-11B. On the other end of this shielded cable, twist the shielded strands and connect them to TB2-2 (C). Connect the inner conductor to TB2-3 (C). Run the cable along the chassis as shown.

( ) 15. Fig. 7. Cut both leads on a .01mfd (10K or 10,000mmf) disc capacitor C38 to 5/8". Connect from XV5-9 (C) to TB2-3 (S2).

( ) 16. Fig. 7. Cut both leads on a 4mfd electrolytic capacitor C35 to 3/4". Connect the negative (-) lead to TB2-2 (C) and the positive (+) lead to TB2-4 (C).

( ) 17. Fig. 7. Cut both leads on a 2.2M (red, red, green, silver) resistor, R26 to 1/2". Connect from TB2-2 (S3) to XV5-8 (C).

( ) 18. Fig. 7. From hole "Y", connect the brown lead to TB2-1 (S2) and the red lead to XV6-6 (C).

( ) 19. Fig. 7. Connect a 12" piece of red wire from S1-3A (C) to XV6-6 (C). Run the lead under the shaft of variable capacitor C21 and under R25 as shown.

( ) 20. Fig. 7. Connect a 4" piece of red wire from XV6-6 (C) to TB4-2 (C).

( ) 21. Fig. 7. Cut both leads on a 10K (brown, black, orange, silver) resistor R28 to 1". Connect from XV6-6 (S4) to TB2-4 (C).

( ) 22. Fig. 7. Cut both leads on a 100K (brown, black, yellow, silver) resistor R27 to 5/8". Connect from TB2-4 (S3) to XV5-9 (S3).

( ) 23. Fig. 7. Connect the green lead from hole "U" to S1-4B (S1). Run the lead under the shaft of the variable capacitor C21.

( ) 24. Fig. 7. Cut all leads on two 470K (yellow, violet, yellow, silver) resistor R22 and R23, to 5/8". Connect R23 from XV5-3 (S2) to TB1-1 (C) and R22 from TB1-1 (S3) to TB1-3 (C).

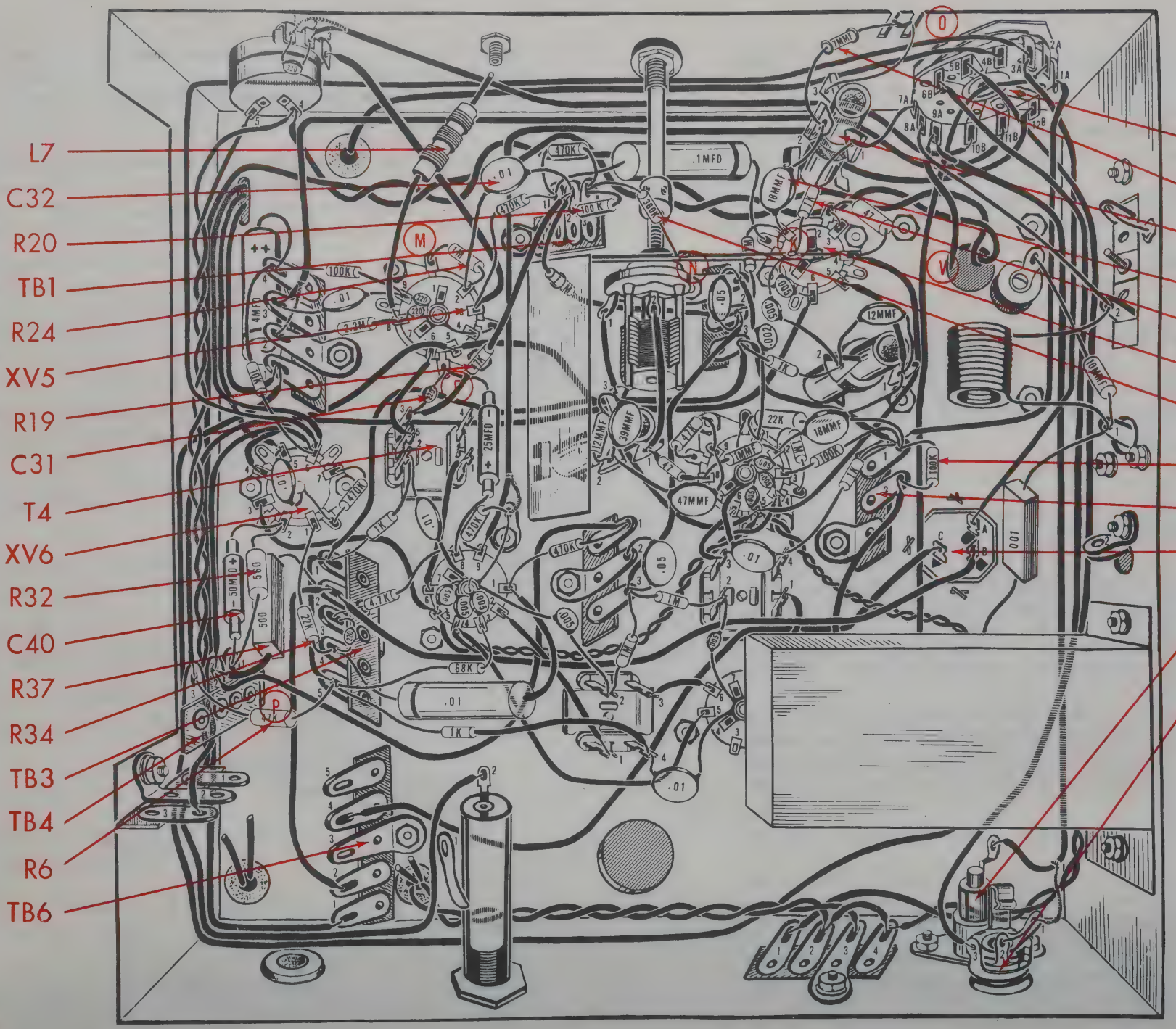

L7
C32
R20
TB1
R24
XV5
R19
C31
T4
XV6
R32
C40
R37
R34
TB3
TB4
R6
TB6
S1
C9
L3
C10
R3
XV1
R21
R12
TB9
C52
J3
J1
O
M
N
K
V
P
.1MFD
470K
100K
3.3M
4MFD
25MFD
50MFD
560
500
68K
1K
22K
47K
47MMF
39MMF
18MMF
12MMF
10MMF
1MMF
.01
.05
.005
.003
100

Fig. 8

( ) 1. Fig. 8. Cut both leads on a 1M (brown, black, green, silver) resistor R24 to 1/2". Connect from XV5-2 (C) to ground lug "M" (S1).

( ) 2. Fig. 8. Cut both leads on a .01mfd (10K or 10,000mmf) disc capacitor C32 to 5/8". Connect from TB1-2 (C) to XV5-2 (S2).

( ) 3. Fig. 8. Cut both leads on a 47K (yellow, violet, orange, silver) resistor R19 to 1 1/4". Cover each lead with a 1" piece of spaghetti. Connect from T4-3 (C) to TB1-2 (C).

( ) 4. Fig. 8. Cut both leads on a 100K (brown, black, yellow, silver) resistor R20 to 1/2". Connect from TB1-2 (S4) to TB1-3 (C).

( ) 5. Fig. 8. Cut both leads on a 360K (orange, blue, yellow, gold) 5% resistor R21 to 5/8". Connect from TB1-3 (S3) to Tab "N" (S1).

( ) 6. Fig. 8. Connect a 1 3/4" piece of green wire from XV5-6 (S1) to T4-5 (S1).

( ) 7. Fig. 8. Cut both leads on a 220mmf disc capacitor C31 to 1/2". Connect from T4-3 (S2) to ground lug "F" (S2) on XV5.

( ) 8. Fig. 8. Cut both leads on the 100mh choke L7 to 1". Cover each lead with a 3/4" piece of spaghetti. Connect one lead from the choke to XV5-8 (S3). Leave the other lead free.

( ) 9. Fig. 8. Connect a 1" piece of bare wire from L3-3 (S1) to ground lug "O" (C).

( ) 10. Fig. 8. Cut both leads on a 7mmf tubular ceramic capacitor C9 to 5/8". Connect from ground lug "O" (S2) to L3-2 (C).

( ) 11. Fig. 8. Cut both leads on the 18mmf disc capacitor C10 to 1/2". Connect from L3-2 (S2) to XV1-1 (S2).

( ) 12. Fig. 8. Cut both leads on a 1K (brown, black, red, silver) resistor R3 to 1/2". Connect from Tab "K" (S3) to L3-1 (C).

( ) 13. Fig. 8. Connect a 1" piece of bare wire from S1-7A (S1) to L3-1 (S2).

( ) 14. Fig. 8. Connect a 5" piece of red wire from S1-3A (S2) to C52-A (S1). Run along the bottom corner of the chassis as shown.

( ) 15. Fig. 8. Connect a 5" piece of red wire from S1-1A (S1) to TB9-1 (C).

( ) 16. Fig. 8. Cut both leads on a 100K (brown, black, orange, yellow, silver) resistor R12 to 1/2". Connect from TB9-1 (S6) to TB9-2 (S2).

( ) 17. Fig. 8. On one end of an 8 1/2" piece of shielded wire, (marked on cable's body as RG-174/U or 21-598) strip the outer insulation back 1/2". Twist the shield strands together and cut them off. Strip back 1/4" of the insulation from the inner conductor. Connect the inner conductor to S1-9A (C).

On the other end of the same piece of shielded wire, strip the outer insulation back 1". Twist the shield strands together but do not cut them off. Cut the inner conductor to 1/2", and strip the insulation back 1/4" from the end of the inner conductor. Connect the inner conductor to J3 (S1) and the twisted shield strands to J1-1 (C). Run the lead along the chassis below the shielded unit as shown. Connect a 3/4" bare wire from J1-1 (S2) to J1-2 (S1).

( ) 18. Fig. 8. Connect a 10" piece of black wire from S1-6B (S1) to J1-3 (S1). Run the lead along the chassis below the shielded unit as shown.

( ) 19. Fig. 8. Connect one end of a 4" piece of heavy bare wire covered with a 3 1/2" piece of spaghetti so S1-9A (S2). Push the other end through hole "V". When connecting to the switch, do not wrap the wire around lug 9 (S1-9A) on S1.

( ) 20. Fig. 8. Connect a 2 1/2" piece of red wire from TB3-1 (S3) to TB3-5 (C).

( ) 21. Fig. 8. Cut both leads on a 500Ω wire wound resistor R37 to 1". Connect one lead to TB3-2 (C). Cover the second lead with a 3/4" piece of spaghetti and connect to TB4-2 (S3).

( ) 22. Fig. 8. Connect a 1" piece of bare wire from the eyelet ground "P" (S1) on TB4 to the eyelet of lug TB4-1 (S1).

( ) 23. Fig. 8. Cut both leads on a 50mfd electrolytic capacitor C40 to 5/8". Connect the positive (+) lead to XV6-2 (C) and the negative (-) lead to TB4-1 (C).

( ) 24. Fig. 8. Cut both leads on the 560Ω (green, blue, brown, silver) 2 watt resistor R32 to 5/8". Connect from XV6-2 (S2) to TB4-1 (S2).

( ) 25. Fig. 8. Cut both leads on a 47K (yellow, violet, orange, silver) resistor R6 to 5/8". Connect from TB4-3 (S2) to TB3-5 (S4).

( ) 26. Fig. 8. Connect a 4" piece of red wire from TB3-2 (S3) to TB6-2 (C).

( ) 27. Fig. 8. Cut both leads on a 22K (red, red, orange, silver) 1/2 watt resistor R34 to 3/4". Connect from XV6-1 (S1) to TB3-4 (C).

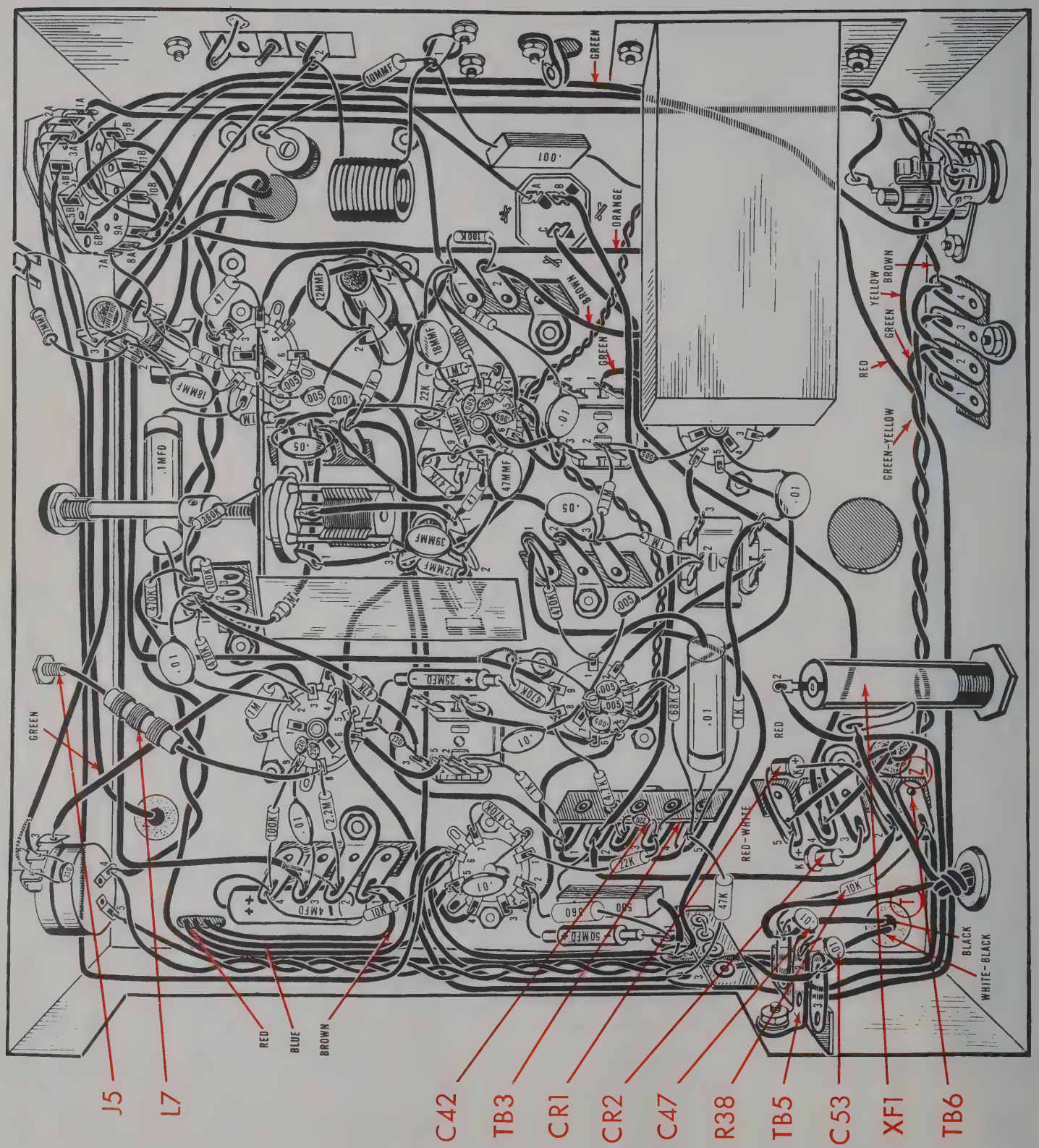

J5
L7
C42
TB3
CR1
CR2
C47
R38
TB5
C53
XF1
TB6
GREEN
RED
BLUE
BROWN
ORANGE
GREEN
BROWN
GREEN
YELLOW
BROWN
RED
GREEN-YELLOW
RED
RED-WHITE
BLACK
WHITE-BLACK

Fig. 9

( ) 1. Fig. 9. Cut both leads on a 220mmf disc capacitor C42 to 1/2". Connect from TB3-4 (S3) to TB3-3 (S2).

( ) 2. Fig. 9. Connect the black lead from hole "T" to TB5-1 (C).

( ) 3. Fig. 9. Connect the black-white lead from hole "T" to TB5-3 (C).

( ) 4. Fig. 9. Cut all leads on two .01mfd (10K or 10,000mmf) disc capacitors C47 and C53 to 1/2". Connect C53 from TB5-3 (S3) to TB5-2 (C). Connect C47 from TB5-2 (S2) to TB5-1 (C).

( ) 5. Fig. 9. Cut both leads on a 10K (brown, black, orange, silver) resistor R38 to 3/4". Connect from TB5-1 (C) to TB6-1 (S2).

( ) 6. Fig. 9. From hole "Z", connect the red white lead to TB6-5 (C) and the red lead to TB6-4 (S2).

( ) 7. Fig. 9. You have been supplied with two silicon rectifiers, CR1 and CR2. Note that excessive heat on the leads of these rectifiers can ruin them. When you solder be careful not to apply any excessive heat to the terminals.

When soldering, place a pair of long nose pliers on the lead between the solder lug and the rectifier to conduct the heat away from the iron so that the heat will not reach the rectifier. With this precaution in mind, you are now ready to wire your rectifiers into the circuit. The rectifiers may take different shapes. The various shapes are indicated in the introductory section of this instruction book. In this same section of the book the cathode (abbreviated K or +) side of the rectifier has been indicated.

Cut both leads on the rectifier CR1 to 1". Connect the cathode (+) lead to TB6-2 (S2) and the negative (-) lead to TB6-5 (C).

Cut both leads on the rectifier CR2 to 3/4". Connect the cathode (+) lead to TB6-5 (S3) and the negative (-) lead to TB6-3 (S1).

( ) 8. Fig. 9. Push the end of the line with the tinned leads through the rubber grommet at the rear of the chassis. Tie a knot in the line cord 2 1/2" from the tinned ends. This knot is to be tied inside the chassis so that the line cord cannot pull through the grommet. Connect one of the tinned leads to TB5-1 (S3) and the remaining tinned lead to XF1-1 (S1).

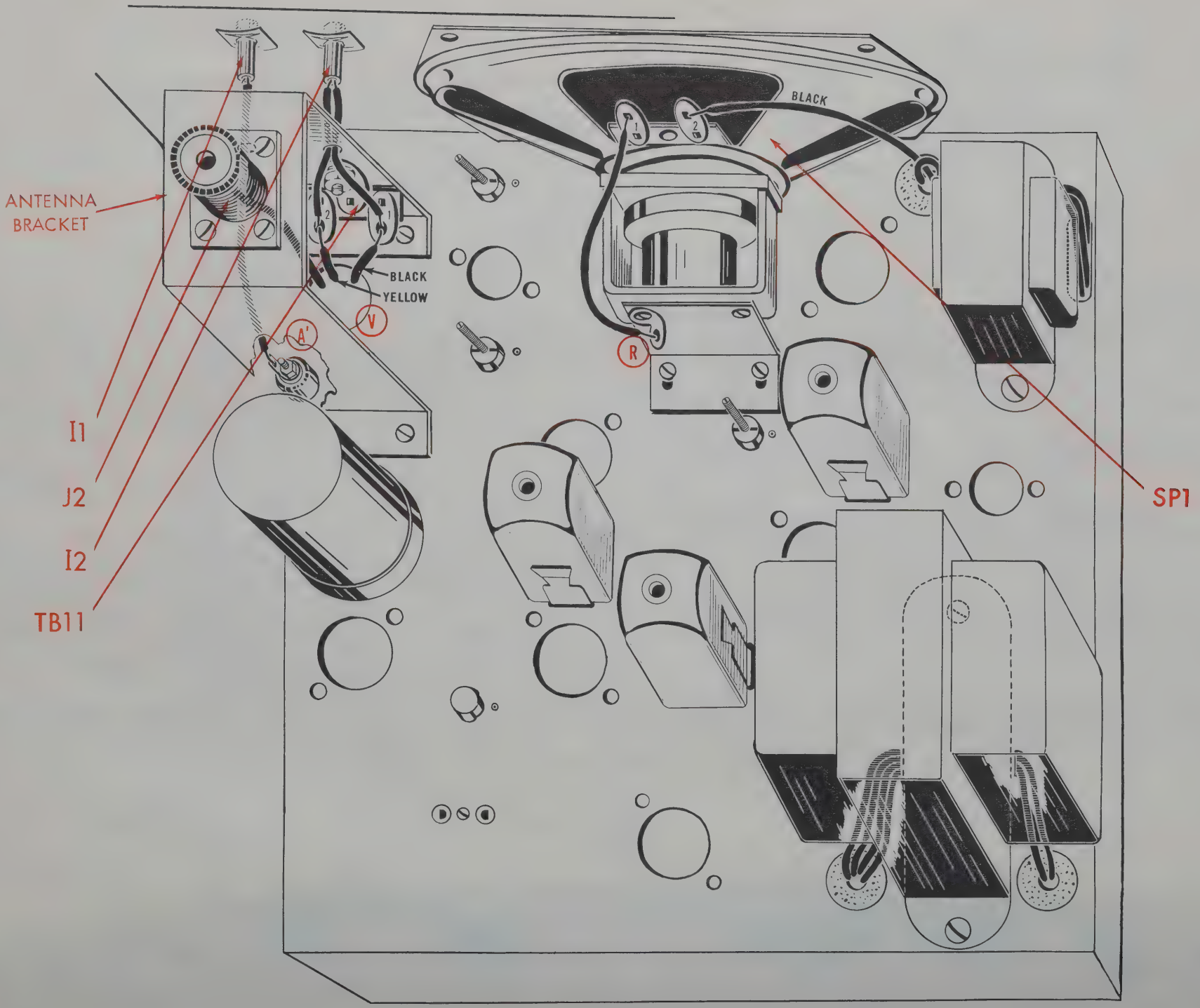


Fig. 10

( ) 1. Fig. 10. Mount the speaker bracket to the chassis as shown. See Figure 3 for the orientation. Use two #4-40 x 1/4 screws, two #4 lockwashers and two #4 hex nuts.

( ) 2. Fig. 10. Mount the speaker SP1 to the speaker bracket, as shown in figure 3, with the lugs up. Use two #4-40 x 1/4 screws and one #4 ground lug. If the screws do not go into the tapped holes in the speaker, clean the glue out from the speaker holes.

( ) 3. Fig. 10A. Lay the bezel on the table, as shown, with the screw holes up. Place the "L" shaped control plate over the bezel with the nomenclature down, so that you cannot see it. Place the perforated screen over the control plate with the nomenclature down so that you cannot see it. The large holes in the perforated screen must line up with the corresponding holes in the control plate. Secure the control plate and the perforated screen to the panel using the tapped holes at the edge of the bezel. Use ten #6-32 x 1/8 screws.

( ) 4. Fig. 10A. Pass the two neon bulb assemblies, I1 and I2, from the front of the panel through the two holes labeled "ON" and "TRANS.". Use a flat spring clip over each to secure them to the panel. Press the spring clips over the bulbs while holding the bulbs to the front of the panel with your hands or resting them against a small wooden block.

( ) 5. Fig. 10. Remove the flatwasher and the hex nuts from the two controls at the extreme ends of the front apron on the chassis. Remove the bushing from the control at the center of the front apron on the chassis. Mount the panel-bezel assembly to the front apron of the chassis lining up the holes and control shafts on the chassis with the holes on the control shafts on the chassis with the holes on the panel. Secure the panel to the chassis using the hardware just removed — one flatwasher and one hex nut on the controls at the extremes of the panel (OFF/VOLUME and TRANSMIT/RECEIVE) and the bushing on the center control (RECEIVER). Do not tighten these pieces of hardware yet.

( ) 6. Fig. 10. Mount the MIC. jack J5, as shown in Figure 9. Use one #10 flatwasher and #10-32 hex nut. Tighten this hex nut as well as all the control nuts used in step 5 above.

( ) 7. Fig. 10. Connect the black lead from transformer T1 to SP1-2 (S1).

( ) 8. Fig. 10. Connect a 3" piece of black wire from SP1-1 (S1) to ground lug "R" (S1).

( ) 9. Fig. 10. From hole "V", connect the black wire to TB11-1 (C) and the yellow wire to TB11-2 (C).

( ) 10. Fig. 10. On neon bulb I1, clip one of the leads. Cut the remaining lead to 1 3/4". Cover it with a 1 1/2" piece of spaghetti. Run this lead through one of the nearby holes in the front of the antenna bracket and connect it to "A" (S1).

( ) 11. Fig. 10. On neon bulb I2, cut one lead to 1 1/4". Cover it with a 1" piece of spaghetti and connect it to TB11-1 (S2). Cut the remaining lead to 1 3/4". Cover it with a 1 1/2" piece of spaghetti and connect it to TB11-2 (S2).

( ) 12. Fig. 10. Connect the spaghetti covered heavy bare wire from hole "V" to J2 (S1).

( ) 13. Fig. 10. Cover the free lead on coil L7 with a 1" piece of spaghetti as shown in Figure 9. Pass this lead through the center hole in the MIC jack, J5. Solder the coil lead to the little center eyelet. Be careful not to use excess solder so that it will not short against the side (ground) of the jack either inside or outside the panel. Clip off the excess length of lead. When soldered properly, the center solder lug will serve as one contact for the microphone cable. It should appear as a ball of solder at the center of the connector.

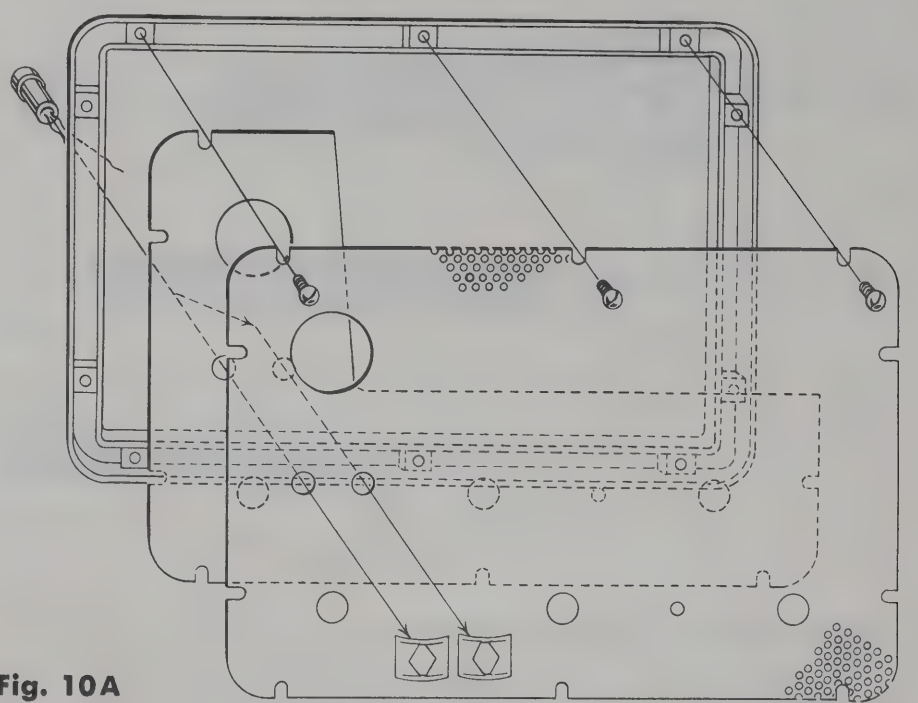


Fig. 10A

FINAL STEPS

You have now completed the assembly and wiring of your Citizen's Band Transceiver. When you have completed the following steps your unit will be ready for use.

1) To catch any wiring errors, it is suggested that the entire wiring be checked point-by-point against the wiring instructions (and preferably also against the schematic wiring diagram in order to become more familiar with the component layout and circuitry). While doing so, check for rosin joints, loose lumps of solder, poor lead dress, and accidental shorts or leakage paths arising from the flow of rosin between contacts (remove with a stiff brush dipped in carbon tetrachloride).

2) In one package you will find tubes V3, V7, and a crystal. Do not mix these tubes up with the other tubes in the unit as these have been specially matched. Insert the two tubes and the crystal in the sockets so marked on the tube layout chart in the Instruction Manual.

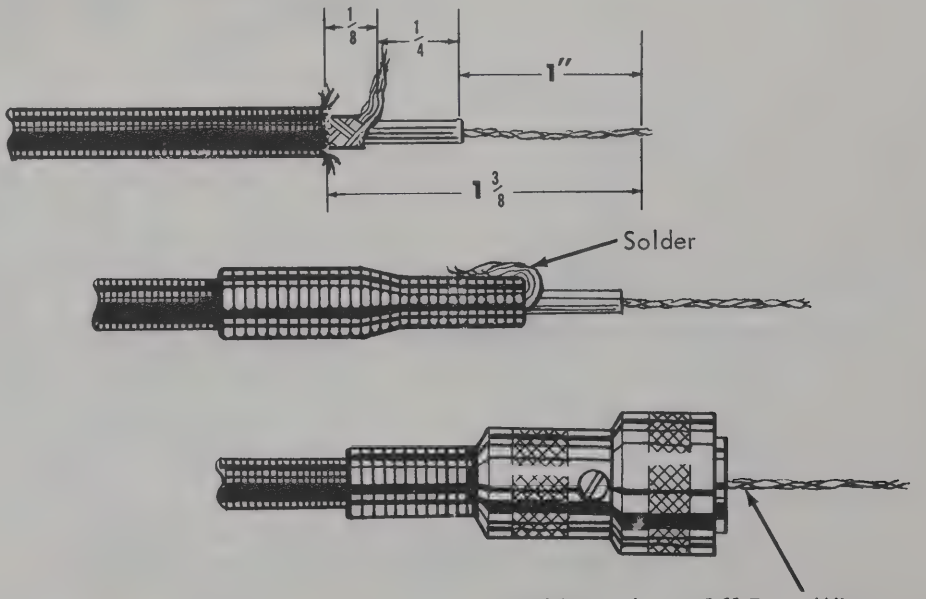
3) Insert all other tubes in the appropriate socket as indicated on the tube layout chart in the instruction manual. Insert the fuse into the fuseholder.

4) Turn the OFF/VOLUME control to the extreme counter-clockwise position actuating the switch to OFF. Place the "round" knob so that the dot points to the slant between the words "OFF" and "VOLUME". Push the knob onto the control shaft in this position. Turn the RECEIVER control so that the capacitor plates are fully meshed (maximum capacity). Place the "round" knob so that it is pointing to one dot past the "1" (to 2). Push the knob onto the shaft in this position. With the TRANSMIT/RECEIVE switch in the middle position, push the bar knob onto the shaft so that the dot faces "R".

5) If you have a VTVM or VOM, make the following checks before connecting to the AC line. Turn the power switch on the volume control clockwise from the "OFF" position. Put the TRANSMIT/RECEIVE switch to the "R" position. Check for a cold DC resistance of between 10 and 14 ohms across the AC line plug; check for a resistance of at least 100K ohms across C52 (half moon). Connect the negative meter lead to ground and allow sufficient time for the electrolytic capacitors to be charged by the ohmmeter battery. These measurements constitute a reasonable test of the power supply components and wiring before applying power. If you do not obtain the resistances indicated, do not proceed to the next step until the cause is discovered and the condition remedied.

6) Snap the CALL button into the hole provided on the front panel under the word ANTENNA. Place the button so that the lettering on the button is in the same direction as the rest of the panel.

7) From the end of the microphone cable (away from the microphone) strip the outer cotton covering back 1 3/8". Separate the strands in the braid with a fine pointed instrument 1/8" from the cotton covering. Cut the strands so that 1/4" will remain near the outer insulation. Strip the inner insulation back 1" from the end of the wire.



Loosen the small set screw in the microphone connector and remove the spring with the large diameter over the wire until the edge of the small diameter lines up with the outer insulation. Bend the shield strands over the small diameter of the spring and solder the strands to the spring. Use a minimum amount of solder, spread the strands and solder evenly and thinly around the circumference of the spring. Push the inner conductor through the hole in the center of the microphone connector. Push the microphone connector back onto the small diameter of the spring. Tighten the screw in the connector so that it holds firmly to the spring. Solder the inner conductor to the center rivet in the connector. Take the precaution so that excess solder will not flow into the connector shorting the center rivet to the side. Cut off the excess portion of the inner conductor protruding from the connector. When the soldering has been successfully completed, a small ball of solder on the center rivet will service the dual purpose of holding the inner conductor to the center rivet as well as the "hot" contact for the connector and microphone.

8) Construct the Dummy Load Assembly and Phone Plug Adaptor for Current Measurement as described on page 8 in the Instruction Book section of this manual.

9) OPERATIONAL CHECK: Put the TRANSMIT/RECEIVE switch in the RECEIVE "R" position. Turn the volume control fully clockwise. "ON" lamp should be lit. Let the unit warm up for several minutes. A hiss or crackling sound should be heard from the speaker. Next put a small screwdriver into the ANTENNA jack. Touch the uninsulated portion of the screwdriver with your hand. A click should be heard from the speaker.

Insert the dummy load into the rear Antenna Jack. Put the TRANSMIT/RECEIVE switch up to a transmit position "T". The TRANS. light should glow. The bulb in the dummy load should also glow brightly.

Now proceed to the "touch-up" alignment as outlined in the RECEIVER SECTION ALIGNMENT section under MAINTENANCE in your Instruction Manual.

10) The four plastic feet are to be mounted to the bottom of the cabinet. The larger diameter of each foot fits against the bottom. Push a 6-32 x 5/16 screw from the inside of the cabinet through the hole in the center of each foot. From the outside of the cabinet, secure each foot to the bottom using one #6 lock-washer and one #6-32 hex nut.

11) Slide the transceiver into the cabinet passing the line cord through the rectangular cutout at the rear of the cabinet. When it is properly mounted in the cabinet, the front bezel will fit snugly against the lip around the cabinet. Secure the chassis to the cabinet with four #6 self-tapping screws in the four holes near the corners of the rectangular cutout at the rear of the cabinet.

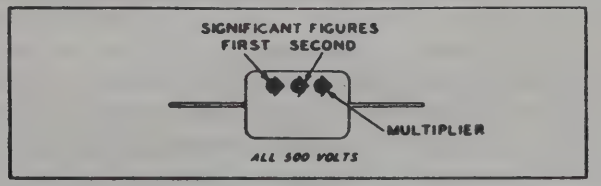
12) Installation and operating procedure will be found in the Instruction Book section of this manual.

SERVICE

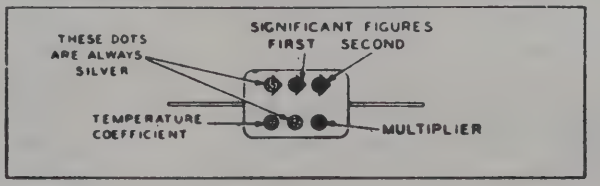
If you are still having difficulty, write to our service department listing all possible indications that might be helpful. Note the code number appearing in red under the word "Manual" on the front cover. If there is no number, state this. If desired, you may return the instrument to our factory where it will be placed in operating condition for $9.00 plus the cost of parts replaced due to their being damaged in the course of construction. This service policy applies only to completed instruments constructed in accordance with the instructions as stated in the manual. Instruments that are not completed or instruments that are modified will not be accepted for repair. Instruments that show evidence of acid core solder or paste fluxes will be returned not repaired. NOTE: Before returning this unit, be sure all parts are securely mounted. Attach a tag to the instrument, giving your home address and the trouble with the unit. Pack very carefully in a rugged container, using sufficient packing material (cotton, shredded newspaper, or excelsior), to make the unit completely immovable within the container. The original shipping carton is satisfactory, providing the original inserts are used or sufficient packing material is inserted to keep the instrument immovable. Ship by prepaid Railway Express, if possible, to the Electronic Instrument Co., Inc., 33-00 Northern Blvd., L.I.C. 1, New York. Return shipment will be made by express collect. Note that the carrier cannot be held liable for damages in transit if packing, IN HIS OPINION, is insufficient.

CAPACITOR COLOR CODES

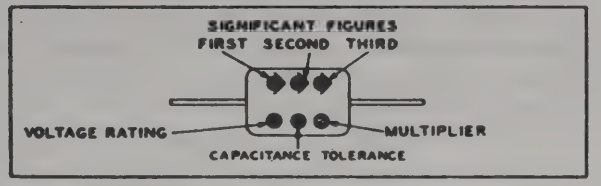
RMA 3-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



JAN 6-DOT COLOR CODE FOR PAPER-DIELECTRIC CAPACITORS



RMA 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



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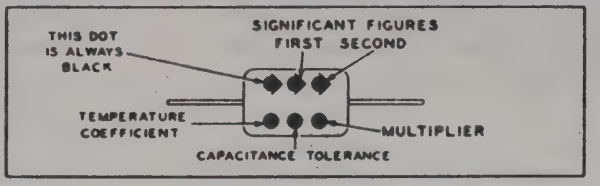
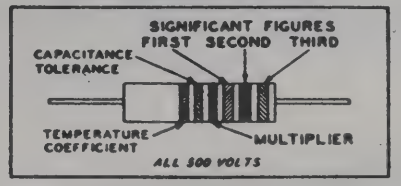


RMA COLOR CODE FOR TUBULAR CERAMIC-DIELECTRIC CAPACITORS



JAN COLOR CODE FOR FIXED CERAMIC-DIELECTRIC CAPACITORS

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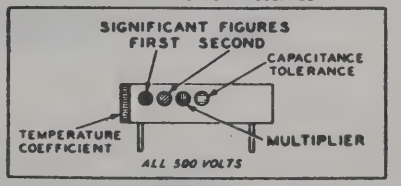

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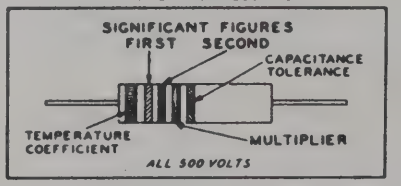


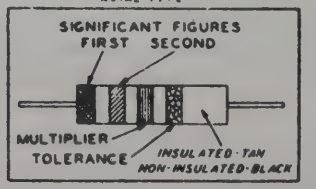
RMA: RADIO MANUFACTURERS ASSOCIATION
JAN: JOINT ARMY-NAVY

RESISTORS				CAPACITORS				
				MULTIPLIER				
TOLERANCE	MULTIPLIER	SIGNIFICANT FIGURE	COLOR	RMA MICA AND CERAMIC-DIELECTRIC	JAN MICA AND PAPER-DIELECTRIC	JAN CERAMIC DIELECTRIC	VOLTAGE RATING	TEMPERATURE COEFFICIENT
	1	0	BLACK	1	1	1		A
	10	1	BROWN	10	10	10	100	B
	100	2	RED	100	100	100	200	C
	1000	3	ORANGE	1000	1000	1000	300	D
	10,000	4	YELLOW	10,000			400	E
	100,000	5	GREEN	100,000			500	F
	1,000,000	6	BLUE	1,000,000			600	G
	10,000,000	7	VIOLET	10,000,000			700	
	100,000,000	8	GRAY	100,000,000		0.01	800	
	1,000,000,000	9	WHITE	1,000,000,000		0.1	900	
5	0.1		GOLD	0.1	0.1		1000	
10	0.01		SILVER	0.01	0.01		2000	
20			NO COLOR				500	

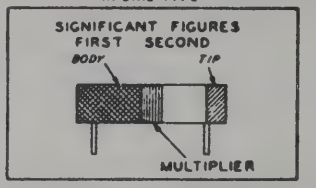
RESISTOR COLOR CODES

RMA COLOR CODE FOR FIXED COMPOSITION RESISTORS

AXIAL TYPE

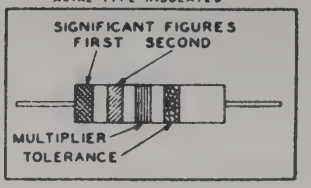


RADIAL TYPE



JAN COLOR CODE FOR FIXED COMPOSITION RESISTORS

AXIAL TYPE INSULATED



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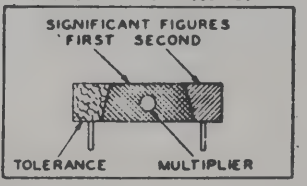


g) IF Alignment: With the control settings as left at the completion of the local oscillator alignment, and the apparatus left connected which energizes crystal oscillator stage V3B, connect the "hot" lead of either a VOM (of 2KΩ/V sensitivity or higher) or a VTVM set for a-c voltage measurement to pin 5 (plate) of audio output stage V6. Connect the common or ground lead of the instrument to the chassis of the transceiver. If the VOM has a function position designated "OUTPUT", use this position (which places an internal blocking capacitor in series to block out the DC voltage at the plate of the tube), or else you must connect to pin 5 through an external blocking capacitor of 0. 1mf. Set the VOM or VTVM to the 50VAC range or thereabouts. Now turn the VOLUME control clockwise from OFF and set it at about mid-rotation. Again allow a warm-up time of several minutes to achieve stable operation. You will hear the 120 cycle hum (and distortion components thereof) as before in the alignment of the local oscillator. In addition, the a-c voltmeter connected to pin 5 of V6 will give a quantitative measure of the audio signal you hear. Adjust the VOLUME control to obtain an approximately center-scale reading on the meter. Now adjust all three IF transformers T4, T3, and T2, both top and bottom for a maximum meter reading, employing a tuning wand. Adjust the IF transformer cores in the following order: top of T4, bottom of T4, top of T3, bottom of T3, top of T2, bottom of T2 ("top" indicating adjustment accessible from top end IF can and "bottom" indicating adjustment accessible from under-chassis end of IF can). Remember that only a slight turn either left or right in each case will be required to achieve top performance. Repeat this procedure two more times, or until no more improvement can be noticed. If the meter reading reaches full scale during the adjustment procedure, back off the VOLUME control to obtain a mid-scale reading again in order that further improvement in alignment can be observed. When IF alignment is completed, it will be evidenced by a strong "rushing" sound from the speaker varying with the setting of the VOLUME control.

h) RF Alignment: Coil L4 in the RF amplifier requires a slight "touch-up" alignment also. This alignment follows immediately after the IF transformer alignment described above and the set-up is unchanged. With a tuning wand or insulated screwdriver, turn the adjustment screw on the top of L4 slightly left or right for a maximum meter reading. (Turn VOLUME control to OFF). Performance will also benefit somewhat by optimizing the adjustment of coil L3. To adjust coil L3, remove the apparatus that "defeats" the B+ disconnection of the crystal oscillator stage, and set the TRANSMIT/RECEIVE switch at RECEIVE. (Turn VOLUME control to "on" position). Now connect the antenna, and set the RECEIVER tuning control to receive some station at about the center of the Citizen Band, if possible. With a hex tuning wand or an insulated screwdriver, turn the adjustment screw on the top-of-chassis end of L3 slightly either left or right to achieve maximum loudness of the received transmission. It should be noted that the adjustment of L3 is very broad and it is perfectly satisfactory to adjust in this way.

Method 2: Receiver Alignment Using Signal Generator.

Perform steps (a) through (f) of Method 1, and then proceed to step (g) below after disconnecting the special apparatus used to provide poorly filtered B+ operating voltage for the crystal oscillator stage.

g) IF Alignment: After complying with the above, connect the "hot" lead of a VOM (2KΩ/V minimum sensitivity) or a VTVM to pin 5 (plate) of audio output stage V6 and the common or ground lead to chassis ground. Use the 50VAC range or thereabouts, and if a VOM is employed, set it at the "output" measuring function (or else connection to pin 5 of V6 must be made through an 0. 1mf blocking capacitor). Now connect the "hot" lead of an RF signal generator (EICO 324) to pin 2 (grid) of V2, and the ground lead to the transceiver chassis. Turn the transceiver VOLUME control to three-quarters full clockwise rotation. Set the signal generator to obtain a modulated 1750kc signal and adjust the output attenuator for a one-quarter of full scale reading on the meter. Allow a 30 minute warm-up for the signal generator to ensure freedom from drift during the alignment procedure. Now adjust all three IF transformers, T4, T3, and T2, both top and bottom for a maximum meter reading. Adjust the IF transformer cores in the following order: top of T4, bottom of T4, top of T3, bottom of T3, top of T2, bottom of T2 ("top" indicating adjustment accessible from top end of IF can, and "bottom" indicating adjustment accessible from under-chassis end of IF can). Remember that only a slight turn either left or right in each case will be required to achieve top performance. Repeat this procedure two more times, or until no more improvement can be noticed. As alignment proceeds, back off the signal generator output attenuator to keep the meter reading between one-quarter and one-half scale. When IF alignment is completed, it will be evidenced by a strong "rushing" sound from the speaker varying with the setting of the VOLUME control.

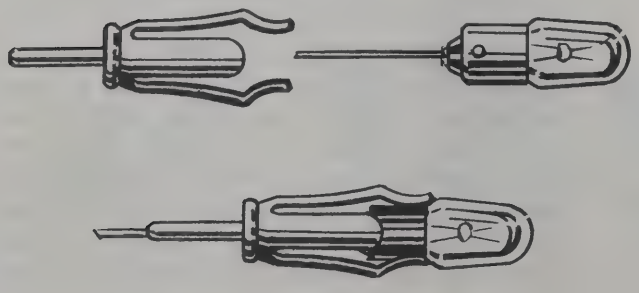
h) RF Alignment: Coils L3 and L4 in the RF amplifier require a slight "touch-up" alignment also. This alignment follows immediately after the IF transformer alignment described above, and the set up is exactly the same except that the signal generator is now set at 27mc and is connected to either antenna connector ("hot" lead to center conductor contact of antenna connector through 100Ω resistor and ground lead to transceiver chassis). Set the transceiver VOLUME control so that the modulation is audible. Then set the signal generator output attenuator so that the a-c voltmeter connected to pin 5 (plate) of V6 reads one-quarter of full scale on the 50VAC range. With a tuning wand or insulated screw driver, turn the adjust-

ment screws on the top-of-chassis ends of L4 and L3 slightly either left or right to obtain a maximum meter reading. Repeat these adjustments until there is no further improvement, backing off the signal generator output attenuator as required to keep the meter reading between one-quarter and one-half scale as alignment proceeds. This completes the alignment of the receiver section. Turn VOLUME control to OFF.

TRANSMITTER SECTION ADJUSTMENT

The crystal oscillator circuit elements are pre-set and sealed at the factory and should not be tampered with. The only adjustments required are of trimmers C6 and C7 in the plate tank circuit of the final RF amplifier. These adjustments must be made finally with the actual antenna connected, meaning that you will be actually radiating energy during the adjustments. In the procedure below, a dummy load is substituted for the actual antenna in order to permit a check of the operation and to allow a practice adjustment without radiating energy. In order to make the adjustments, you will need to read the plate current of the final RF amplifier for which purpose a phone jack is provided on the rear chassis apron. You will be required to wire meter connection leads to a phone plug supplied, as well as construct the dummy load from a #47 lamp and an antenna plug supplied. Again, note that the dummy load is not the equivalent of the actual antenna and that the procedure must be performed finally with the actual antenna connected.

a) Construction of Dummy Load: Solder a 2 inch length of bare wire to the center contact of the #47 lamp (92000). Feed the free end of the bare wire through the center post of the antenna plug. Push the lamp into the split shank of the antenna plug until the metal socket of the lamp is entirely inside the split shank. Solder the bare wire to the center post of the antenna plug. Solder the metal socket of the lamp to the split shank of the antenna plug at one point. Cut off excess of bare wire protruding from the center post of the antenna plug. If necessary, file or cut away any solder bubbles or excess solder on the center post or the split shank of the antenna plug.



ANTENNA PLUG AND #47 LAMP

b) Construction of Phone Plug Adaptor for Current Measurement: Cut off a 12 inch length of red and 12 inch length of black hook-up wire. Unscrew the bakelite shell from standard phone plug supplied. Strip one end of the red wire and connect and solder it to the short terminal of the plug (center conductor); strip one end of the black wire and connect and solder it to the long terminal of the plug (outer conductor). Thread the red and black wire through the shell and screw the shell back in place. The red wire must make connection to the positive (+) terminal of any dc current meter you use, and the black wire of course goes to the negative (-) terminal of the meter.

c) Adjustment Procedure With Dummy Load: Performed with the transceiver out of its cabinet and laying on its left side. Be sure the crystal is inserted.

1) Insert prepared dummy load into auto radio type connector jack J3 on the rear chassis apron.

2) Turn the VOLUME control clockwise from OFF and set the TRANSMIT/RECEIVE switch to the upper TRANSMIT position.

3) Adjust trimmer C6 to the point where the dummy load just begins to light.

4) Connect the prepared phone plug adaptor to a dc milliameter or a VOM set for dc current measurement on the 100ma range (red wire to positive terminal of meter, black wire to negative terminal). Insert the phone plug into jack J1 on the rear chassis apron.

5) Adjust trimmer C6 for a minimum reading on the meter scale. The minimum reading should fall somewhere between 20 and 30ma, accompanied by maximum brightness of the TRANSMIT lamp on the panel.

6) Adjust trimmer C7 so that the meter reads 27 ma.

7) Repeat steps (5) and (6) above several times (or as many times as is effective) so that the C6 adjustment for a minimum meter reading results in a minimum approaching but not exceeding 27 ma. It is essential that you do not permit the current to exceed 27ma (21 ma plate current plus 6 ma screen current), which corresponds to 5 watts input power to the final RF amplifier, the legal maximum specified by the FCC.

Note: The current, in fact, can be less than 27ma, in which case your input power would be lower than the legal FCC limit. The foregoing procedure should be repeated several times in order to give you the practice necessary for a rapid and correct adjustment with the actual antenna connected instead of the dummy load.

8) Turn the VOLUME control to OFF, and remove the dummy load and the phone plug meter adaptor. The transceiver is now ready to be installed in its cabinet.

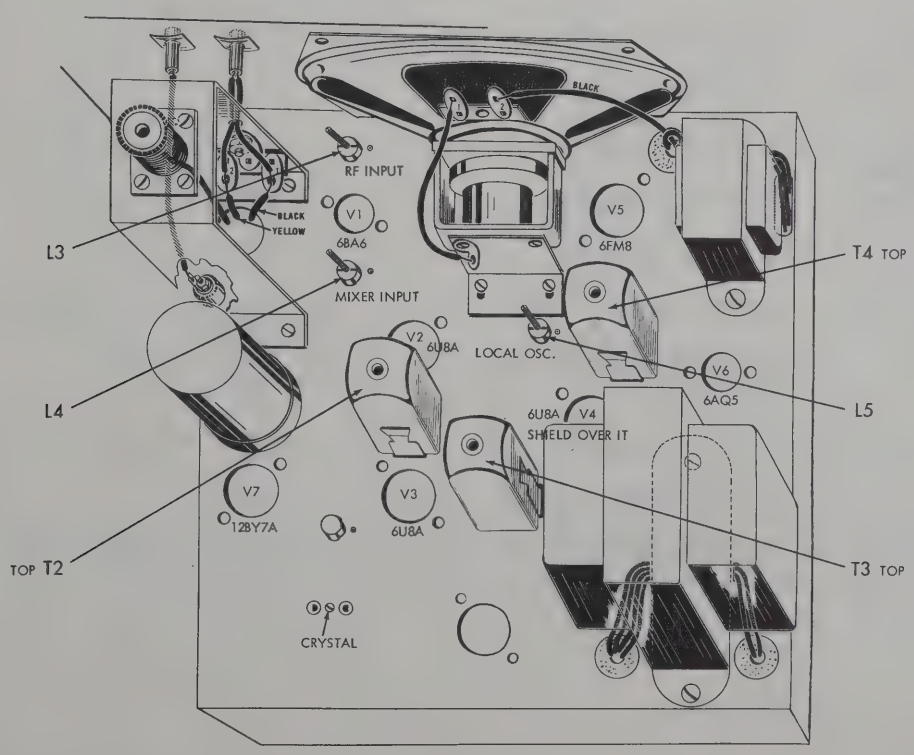
d) Adjustment Procedure With Actual Antenna Connected: With the transceiver installed in its cabinet and the actual antenna connected, repeat procedure (c) above. Be sure to attach the earth ground as well as the microphone. The TRANSMIT lamp on the panel should flicker when talking into the microphone.

TROUBLE SHOOTING

To facilitate servicing, remedial and trouble-shooting procedures have been provided in the TROUBLE-SHOOTING CHART that follows. This chart is based on the assumption that the wiring has been done correctly, and, in fact, has been rechecked for real assurance that no wiring errors or cold solder joints are involved in the malfunction. If this is so, non-operation or improper operation can be attributed only to a defective part or improper adjustment of an adjustable part, and only these possibilities are considered in the chart. Also included in this section are a VOLTAGE chart and a RESISTANCE chart provided as aids in locating defective components and to permit a careful stage-by-stage check of the transceiver. Voltage measurements have been made with a 20,000Ω/V VOM (EICO 555), connecting the common lead to chassis ground. Resistance measurements are also made with the VOM common lead connected to chassis ground, and, most important, with the B+ (point A on the schematic diagram) shorted to chassis ground with a jumper in order to facilitate accurate and rapid measurement of the resistances of interest. This jumper is removed for checking the resistance from the output of the power supply to ground, and, in any case, at the conclusion of the resistance measurements. All measurements, voltage and resistance, are made with the TRANSMIT/RECEIVE switch set at RECEIVE. In voltage measurements, the VOLUME control is turned anywhere clockwise from OFF; in resistance measurements, the transceiver must be disconnected from the power source and the VOLUME control is turned to OFF except where noted. The V7 tube is not included in either chart because its pins are not accessible; the same applies to certain pins of V3.

SERVICE

If trouble develops in your instrument which you can not remedy yourself, write to our service department listing all possible indications that might be helpful. Note number appearing in red under the word "Manual" on the front cover. If there is no number, state this. If desired, you may return the instrument to our factory where it will be placed in operating condition for $9.00 plus the cost of parts replaced due to their being damaged in the course of construction. NOTE: Before returning this unit, be sure all parts are securely mounted. Attach a tag to the instrument, giving your home address and the trouble with the unit. Pack very carefully in a rugged container, using sufficient packing material (cotton, shredded newspaper, or excelsior), to make the unit completely immovable within the container. The original shipping carton is satisfactory, providing the original inserts are used or sufficient packing material is inserted to keep the instrument immovable. Ship by prepaid Railway Express, if possible, to Electronic Instrument Co., Inc., 33-00 Northern Blvd., L.I.C. 1, N.Y. Return shipment will be made by express collect. Note that a carrier cannot be held liable for damages in transit if packing IN HIS OPINION, is insufficient.



TROUBLE-SHOOTING CHART

SYMPTOM	POSSIBLE CAUSES	CHECK METHOD/REMEDY
Unit completely inoperative.	Power transformer primary open or connection thereto thru line cord and switch S2.	Check for 8 to 12 ohms primary resistance thru prongs of line cord plug with VOLUME control turned clockwise from OFF.
	Blown fuse.	Check fuse for continuity and also for proper value.
Specific receiver troubles		
ON indicator lamp I2 lights, but no sound at RECEIVE position with VOLUME control turned up.	One or more tubes in receiving chain (all except V7) defective.	Check
	Filament or B+ voltage not applied to one or more tubes.	Use voltage chart to check application of filament and B+ voltages at proper points for each tube.
	On or more IF transformers very badly misaligned or an IF stage is defective.	Touch tip of screwdriver held by the blade to pin 2 of V2. If strong "click" is heard misalignment is likely rather than defect, so perform complete alignment procedure. If no "click" is heard, defective IF stage is likely. Touch tip of screwdriver to pin 2 of V4, and then to the terminal of T2 connected to pin 2 of V3 (pin 2 of V3 itself is not accessible). If "click" is heard at pin 2 of V4, then defect is in the V3 or V2 stages. If "click" is heard at terminal of T2 connected to pin 2 of V3, then defect can only be in V2 stage.
Weak reception.	Improper alignment.	Re-align by procedures given.
	Short in antenna or antenna cable.	Inspect all possible places for short.
	Dummy load connected instead of antenna or left connected with antenna connected to other receptacle.	Remove dummy load.
Specific transmitter troubles		
Dummy load does not light with adjustment of trimmer C6 at TRANSMIT position.	Crystal out of socket.	Check
	V3 or V7 defective.	Check
TRANSMIT pilot lamp I1 (and/or dummy load) does not flicker when talking into microphone at TRANSMIT position.	Shorted microphone cable.	Inspect cable and connector.
	Defective microphone.	Check
	Defective V5.	Check
Weak transmitted signal.	Shorted antenna.	Inspect; also check to see that dummy load is removed.
	Improper antenna used.	Check
	Weak V7 tube	Check and replace.
Power input to final RF amplifier over 5 watts FCC legal limit.	Improperly adjusted C6 and C7.	Check with transmitter adjustment procedure.
	Antenna shorted.	Inspect
Power input to final RF amplifier is too low.	Improperly adjusted C6 and C7.	Check with transmitter adjustment procedure.
	Weak V7.	Check and replace.
	Low B+ voltage.	Check power supply.

REPLACEMENT PARTS LIST

Stock#	Sym.	Description	Am't.
22570	C1*, 12	cap., disc, 12mmf, ±5%, NPO	2
22526	C2*, 4*, 11, 14, 16, 24*, 25*, 27, 30, 48, 49, 50, 51	cap., disc, .005mfd (5K or 5, 000mmf)	13
22017	C3*, 45*	cap., tub., 10mmf, ±5%, NPO	2
21012	C5*	cap., mica, .001mfd, ±10%, 1000V (1K or 1000mmf)	1
29500	C6*	cap., trimmer, 3-12mmf, NPO	1
29509	C7*	cap., trimmer, 8-480mmf	1
22572	C8*	cap., disc, .005mfd, ±10%, 1KV (5K or 5000mmf)	1
22010	C9	cap., tub., 7mmf, ±10%,	1
22569	C10, 15	cap., disc, 18mmf, ±5%, NPO	2
22560	C13, 28	cap., disc, .05mfd (50K or 50, 000mmf)	2
22016	C17	cap., tub., 1mmf, ±.25mmf, NPO	1
22505	C18, 26*, 29, 32, 38, 47, 53	cap., disc, .01mfd (10K or 10, 000mmf)	7
22553	C19	cap., disc, .002mfd (2K or 2000mmf)	1
22567	C20	cap., disc, 47mmf, ±5%, NPO	1
29016	C21	cap., tuning, 15mmf	1
22568	C22	cap., disc, 39mmf, ±5%, NPO	1
22015	C23	cap., tub., 12mmf, ±5%, N750	1
22552	C31, 36, 37, 42	cap., disc, 220mmf, ±10%, 1KV	4
20039	C33	cap., tub., .1mfd, 400V	1
22522	C34	cap., disc, 330mmf, ±10%	1
23008	C35	cap., elec., 4mfd, 250V	1
23020	C39	cap., elec., 25mfd, 6V	1
23011	C40	cap., elec., 50mfd, 50V	1
22573	C41	cap., disc, .01mfd, ±10%, 1KV	1
20022	C43	cap., tub., .01mfd, 600V	1
21006	C44*	cap., mica, 220mmf, ±5%	1
21005	C46*	cap., mica, 100mmf, ±5%	1
24017	C52	cap., elec., 3 x 40mfd	1
93007	CR1, 2	rectifier, silicon	2
91006	F1	fuse, 1A, Slo Blo	1
97715	I1, 2	indicator, neon bulb assembly	2
50022	J1	jack, phone (METER)	1
50023	J2	receptacle, antenna	1
50033	J3	jack, antenna	1
97501	J4*	socket, crystal	1
50031	J5	jack, min. phone (MIC)	1
35052	L1*, 7	coil, 100uh, choke	2
35051	L2*	coil, tank, 1.8uh	1
36017	L3	coil, ant., tunable	1
36018	L4	coil, mixer, tunable	1
36019	L5	coil, oscillator, tunable	1
36020	L6*	coil, crystal oscillator, tunable	1
10428	R1*, 6, 10, 19, 35*	res., 47KΩ, 1/2W, ±10% (yellow, violet, orange, silver)	5
10430	R2*, 31	res., 4.7KΩ, 1/2W, ±10% (yellow, violet, red, silver)	2
10432	R3, 4, 11, 15, 17	res., 1KΩ, 1/2W, ±10% (brown, black, red, silver)	5
10407	R5, 8, 13, 14, 18, 24	res., 1MΩ, 1/2W, ±10% (brown, black, green, silver)	6
10410	R7, 12, 20, 27	res., 100KΩ, 1/2W, ±10% (brown, black, yellow, silver)	4
10851	R9	res., 22KΩ, 1W, ±10% (red, red, orange, silver)	1
10422	R16	res., 68KΩ, 1/2W, ±10% (blue, grey, orange, silver)	1
10500	R21	res., 360KΩ, 1/2W, ±5% (orange, blue, yellow, silver)	1
10431	R22, 23, 29, 30, 33	res., 470K, 1/2W, ±10% (yellow, violet, yellow, silver)	5
18059	R25	pot., 1MΩ, w/SPDT (S2)	1
10434	R26	res., 2.2MΩ, 1/2W, ±10% (red, red, green, silver)	1
10400	R28, 38	res., 10KΩ, 1/2W, ±10% (brown, black, orange, silver)	2
10959	R32	res., 560Ω, 2W, ±10% (green, blue, brown, silver)	1
10424	R34	res., 22KΩ, 1/2W, ±10% (red, red, orange, silver)	1
10416	R36*	res., 15KΩ, 1/2W, ±10% (brown, green, orange, silver)	1
14500	R37	res., 500Ω, 5W, ±10% (green, black, brown, silver)	1
10867	R39	res., 47Ω, 1W, ±10% (yellow, violet, black, silver)	1
10436	R40	res., 47Ω, 1/2W, ±10% (yellow, violet, black, silver)	1
60077	S1	switch, rotary	1
	S2	part of R25	
55014	SP1	speaker, 3.2 ohms	1
32023	T1	transformer, modulation output	1
34615	T2	transformer, 1st IF, 1750kc	1
34616	T3	transformer, 2nd IF, 1750kc	1
34617	T4	transformer, 3rd IF, 1750kc	1
30035	T5	transformer, power, 117VAC	1
54016	TB1, 4	terminal strip, 3 post left upright	2
54007	TB2	terminal strip, 3 post, 2 right with ground	1
54018	TB3, 6	terminal strip, 4 post, with ground	2
54004	TB5, 7	terminal strip, 2 post, with ground	2
54005	TB8	terminal strip, 2 post, right with ground	1
54024	TB9	terminal strip, 2 post, left with ground	1
54015	TB10	terminal strip, 3 post, 2 left with ground	1
54003	TB11	terminal strip, 2 post	1
90062	V1	tube, 6BA6	1
90048	V2, 3*, 4	tube, 6U8A	3
90065	V5	tube, 6FM8	1
90047	V6	tube, 6AQ5	1
90064	V7*	tube, 12BY7	1
97800	XF1	fuseholder	1
97035	XV1, 6	socket, 7 pin min., bottom mount w/cp	2
97039	XV2, 5, 7*	socket, 9 pin min., bottom mount w/cp	3
97050	XV3*, 4	socket, 9 pin min., top mount	2
10410		res., 100KΩ, 1/2W, 10%	1
40000		nut, hex, #6-32	21
40001		nut, hex, 3/8-32	4
40007		nut, hex, #4-40	24
40011		nut, wing, #10-32	1
40012		nut, hex, #10-32	2
40016		nut, hex, 1/2-24	1
40036		nut, hex, 1/4-32	1
41000		screw, #6-32 x 1/4	13
41010		screw, #6-32 x 1/8	10
41014		screw, #6-32 x 3/8	4
41016		screw, #4-40 x 1/4	21
41035		screw, #6 P.K. (self tapping)	4
41051		screw, #10-32 x 1/2	1
41069		screw, set, #6-32 x 1/8	2
41075		screw, #4-40 x 3/8	4
41084		screw, #4-40 x 1	1
41086		screw, #6-32 x 5/16	4
42000		washer, lock, 3/8	4
42001		washer, flat, 3/8	2
42002		washer, lock, #6	21
42004		washer, lock, #10	1
42007		washer, lock, #4	23
42011		washer, flat, #10	2
42023		washer, lock, 1/4	1
42029		washer, rubber, 1/2	1
42049		washer, flat, 1/4	1
42511		retainer, ring	2
43001		lug, ground, 3/8	1
43006		lug, ground, #4	4
46011		foot, rubber	4
48003		plug, Ant. "Call"	1
48004		plug, Ant. cabinet	1
49011**		crystal	1
50030		plug, min., mike	1
50032		plug, ant.	1
51001		plug, meter, PL-155	1
51503		clips, IF	3
53033		knob, lever	1
53034		knob, round	2
57000		line cord	1
57500		microphone	1
58004		wire, hook	length
58300		spaghetti	length
58414		wire, coax, grey	length
58416		wire, RG-174/U	length
58500		wire, bare, heavy	length
58501		wire, bare	length
80072		panel, perforate	1
80073		panel, control	1
81210*		chassis	1
81211		bracket, ant.	1
81214		shield	1
81215		bracket "L"	1
81226*		shield box	1
81227		plate, line cord	1
82005		shaft, ext.	1
85000		bushing, panel	1
85004		feed through, ceramic, male	1
85005		feed through, ceramic, female	1
86003		frame	1
88057		cabinet	1
89639		license form	1
92000		bulb, #47	1
97303		tube shield	1
66341		manual of instructions (kit)	1
66084		manual of instructions (wired)	1

*Prewired to chassis.
**May vary.

NOTE: When ordering replacement parts, please include all of the following information: 1) stock number and description given in parts list; 2) quantity; 3) model number of instrument; 4) serial number of instrument (on rear of cabinet). This information will expedite the processing of your order and insure your receiving the correct replacement parts.

VOLTAGE AND RESISTANCE CHART

VOLTAGE CHART

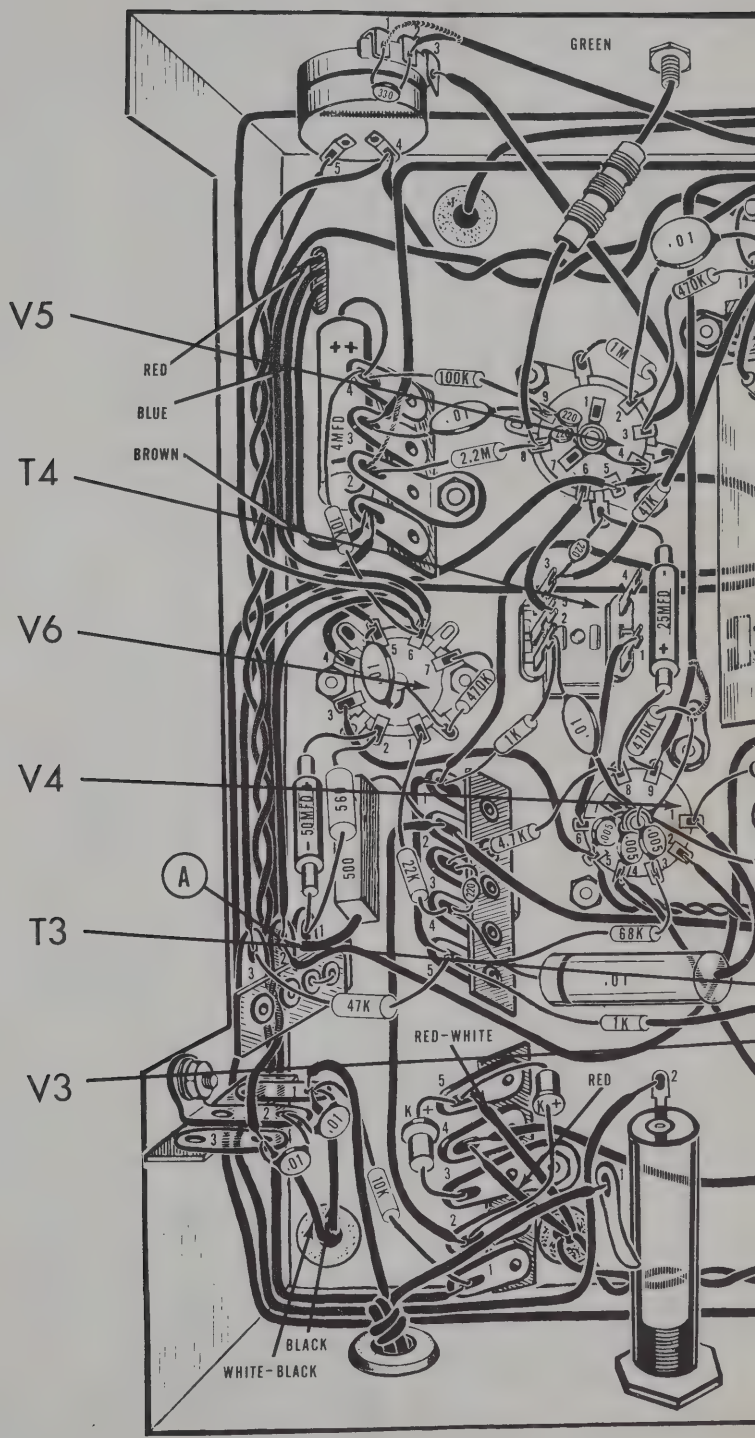
PIN NO. / TUBE	1	2	3	4	5	6	7	8	9
V1 6BA6	0	0	0	6VAC	250	75	0	—	—
V2 6U8A	140	0	75	6VAC	12VAC	250	0	0	0
V3 6U8A	n. a.	n. a.	75	0	6VAC	250	0	n. a.	n. a.
V4 6U8A	50	0	110	12VAC	6VAC	250	0	1.7	0
V5 6FM8	0	0	0	0	6VAC	n. m.	0	0	120
V6 6AQ5	0	17	12VAC	6VAC	240	250	0	—	—

All voltages are dc unless otherwise indicated. All measurements are made using a 20, 000Ω/V VOM with the common lead connected to chassis ground. The transceiver VOLUME control is set anywhere clockwise from OFF, and the RECEIVE/TRANSMIT switch is set at RECEIVE throughout. The pins of V7 and some pins of V3 are not accessible. Abbreviations used: n. a. — not accessible; n. m — do not measure. Values measured should be within ±15%.

RESISTANCE CHART

PIN NO. / TUBE	1	2	3	4	5	6	7	8	9
V1 6BA6	2 Meg	0	0	1	1K	47K	0	—	—
V2 6U8A	22K	1 Meg	100K	1	1	1K	0	1	47K
V3 6U8A	n. a.	n. a.	68K	0	1	1K	0	n. a.	n. a.
V4 6U8A	470K	2. 5Meg	68K	1	1	1K	0	4. 7K	0 to 1/3 Meg*
V5 6FM8	0	1MΩ	1/3 to 1 Meg*	0	1	500K	0	2. 2 Meg	110K
V6 6AQ5	470K	560Ω	1	1	450	0	470K	—	—
Pt. A on schematic (B+)	Not less than 100KΩ after 3 minutes. Positive lead of ohmmeter must be connected to Pt. A								

VOM with common lead connected to chassis ground used for measurement.
All measurements are made with a jumper connected from point A on schematic diagram (B+ output) to chassis ground. Remove jumper at conclusion of measurements or to check resistance from B+ output to ground. Transceiver is disconnected from power source. The TRANSMIT/RECEIVE switch is set at RECEIVE. The VOLUME control may normally be turned to OFF except where asterisk (*) indicates a variation in reading with the VOLUME control setting which may be checked by varying the VOLUME control. The entry " 1" means a very low fraction of 1 ohm. Abbreviations used: n. a. — not accessible. Values measured should be within ±20%.


V5
RED
BLUE
BROWN
T4
V6
V4
A
T3
V3
GREEN
.01
470K
100K
1M
220
2.2M
4MFD
1K
25MFD
10
47K
50MFD
56
500
22K
4.7K
68K
RED-WHITE
RED
10K
BLACK
WHITE-BLACK

VOLTAGE AND RESISTANCE CHART

VOLTAGE CHART

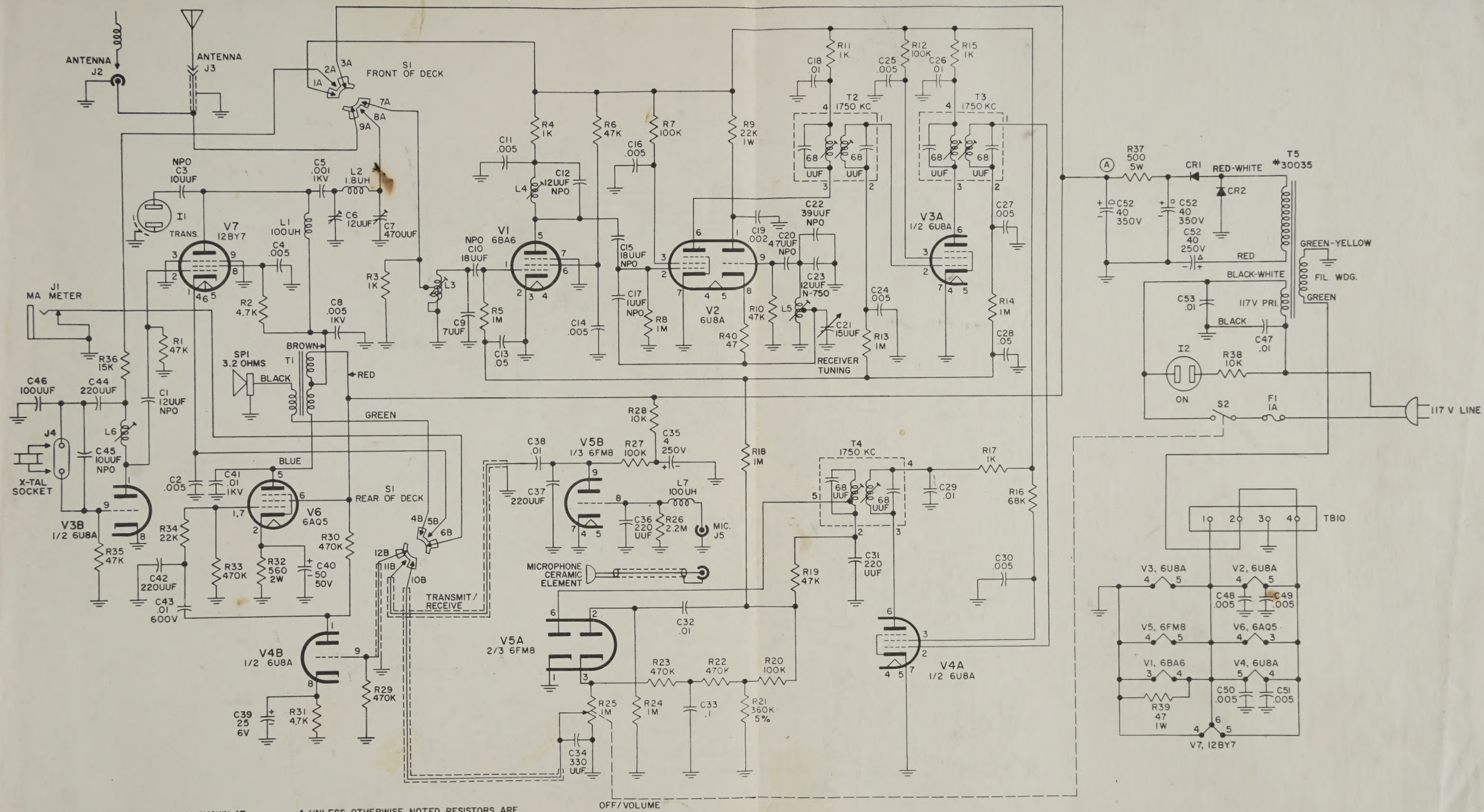
PIN NO. / TUBE	1	2	3	4	5	6	7	8	9
V1 6BA6	0	0	0	6VAC	250	75	0	—	—
V2 6U8A	140	0	75	6VAC	12VAC	250	0	0	0
V3 6U8A	n. a.	n. a.	75	0	6VAC	250	0	n. a.	n. a.
V4 6U8A	50	0	110	12VAC	6VAC	250	0	1.7	0
V5 6FM8	0	0	0	0	6VAC	n. m.	0	0	120
V6 6AQ5	0	17	12VAC	6VAC	240	250	0	—	—

All voltages are dc unless otherwise indicated. All measurements are made using a 20, 000Ω/V VOM with the common lead connected to chassis ground. The transceiver VOLUME control is set anywhere clockwise from OFF, and the RECEIVE/TRANSMIT switch is set at RECEIVE throughout. The pins of V7 and some pins of V3 are not accessible. Abbreviations used: n. a. — not accessible; n. m — do not measure. Values measured should be within ±15%.

RESISTANCE CHART

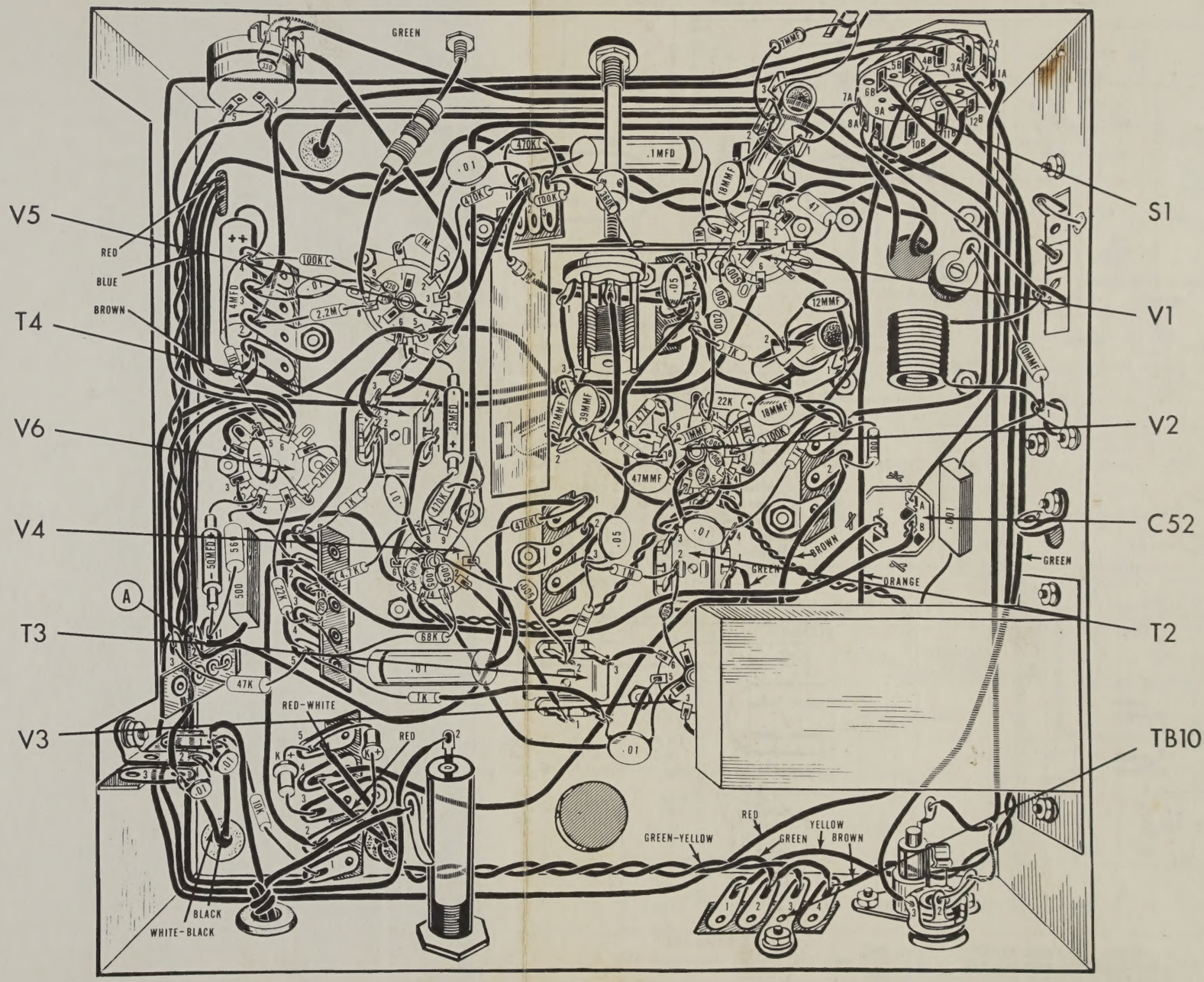
PIN NO. / TUBE	1	2	3	4	5	6	7	8	9
V1 6BA6	2 Meg	0	0	1	1K	47K	0	—	—
V2 6U8A	22K	1 Meg	100K	1	1	1K	0	1	47K
V3 6U8A	n. a.	n. a.	68K	0	1	1K	0	n. a.	n. a.
V4 6U8A	470K	2. 5Meg	68K	1	1	1K	0	4. 7K	0 to 1/3 Meg*
V5 6FM8	0	1MΩ	1/3 to 1 Meg*	0	1	500K	0	2. 2 Meg	110K
V6 6AQ5	470K	560Ω	1	1	450	0	470K	—	—
Pt. A on schematic (B+)	Not less than 100KΩ after 3 minutes. Positive lead of ohmmeter must be connected to Pt. A								

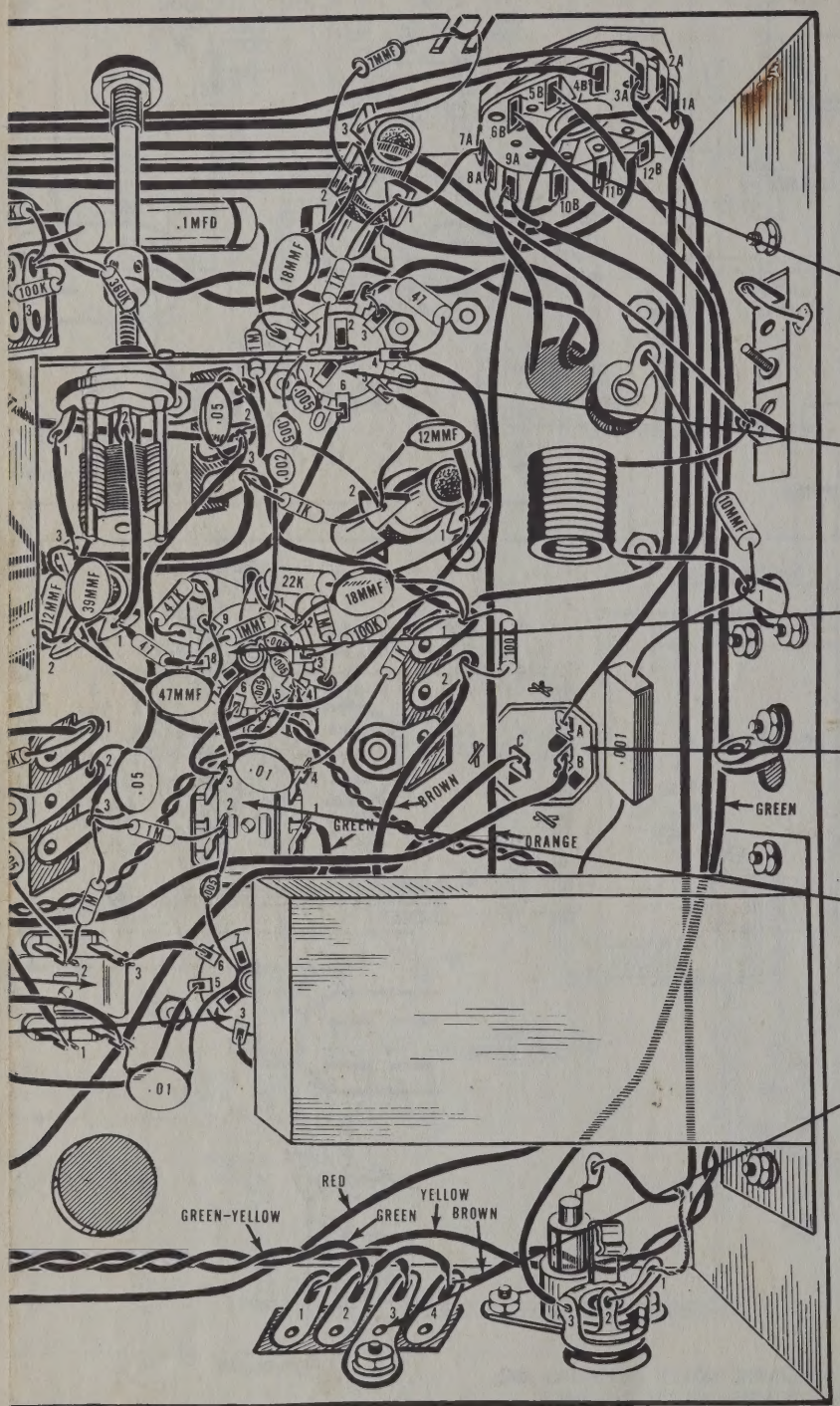
VOM with common lead connected to chassis ground used for measurement.
All measurements are made with a jumper connected from point A on schematic diagram (B+ output) to chassis ground. Remove jumper at conclusion of measurements or to check resistance from B+ output to ground. Transceiver is disconnected from power source. The TRANSMIT/RECEIVE switch is set at RECEIVE. The VOLUME control may normally be turned to OFF except where asterisk (*) indicates a variation in reading with the VOLUME control setting which may be checked by varying the VOLUME control. The entry " 1" means a very low fraction of 1 ohm. Abbreviations used: n. a. — not accessible. Values measured should be within ±20%.



NOTE: 1. TRANSMIT/RECEIVE SWITCH S1 SHOWN AT RECEIVE POSITION.
2. NPO = NEGATIVE-POSITIVE COEFFICIENT ZERO.
3. N-750 = NEGATIVE 750 PART/MILLION/DEGREE C.
4. UNLESS OTHERWISE NOTED RESISTORS ARE EXPRESSED IN OHMS AND ARE 1/2 WATT.
5. UNLESS OTHERWISE NOTED CAPACITORS ARE EXPRESSED IN MICROFARADS.

EICO Model 760 — CITIZENS BAND TRANSCEIVER


V5
T4
V6
V4
T3
V3
S1
V1
V2
C52
T2
TB10
GREEN
RED
BLUE
BROWN
BLACK
WHITE-BLACK
RED-WHITE
GREEN-YELLOW
YELLOW
ORANGE
.1MFD
470K
100K
2.2M
12MMF
18MMF
22K
47MMF
68K
47K
10K
1K
.01
.005
.05
25MFD
50MFD
4MFD


S1
V1
V2
C52
T2
TB10
.1MFD
100K
18MMF
47
.005
12MMF
.05
.1K
39MMF
22K
1MMF
100K
47MMF
.01
.001
100MMF
BROWN
GREEN
ORANGE
GREEN
RED
GREEN-YELLOW
YELLOW
GREEN
BROWN